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Canadian Cancer Statistics 2003

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PRODUCED BY:
CANADIAN CANCER SOCIETY,
NATIONAL CANCER INSTITUTE OF CANADA,
STATISTICS CANADA, PROVINCIAL/
TERRITORIAL CANCER REGISTRIES,
HEALTH CANADA

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"National Cancer Institute of Canada: **Canadian Cancer Statistics 2003**, Toronto, Canada, 2003."

April 2003, ISSN 0835-2976

On the Internet this report is available at http://www.cancer.ca and http://www.ncic.cancer.ca

Additional copies may be requested from Divisions of the Canadian Cancer Society or by calling Cancer Information Service 1-888-939-3333 (see *For Further Information*).

La version française de cette publication est disponible sur demande.

ACKNOWLEDGEMENTS

This monograph was developed by a Steering Committee of the National Cancer Institute of Canada and the Canadian Cancer Society. The Steering Committee includes representatives of the National Cancer Institute of Canada, the Canadian Cancer Society, Health Canada, Statistics Canada, the Canadian Council of Cancer Registries as well as university-based and provincial territorial cancer agency-based cancer researchers.

The production and distribution of the monograph is the result of collaboration among all these groups.

- The provincial and territorial cancer registries supply and review the cancer incidence data used to produce the statistics in this report. The Committee wishes to acknowledge the essential contribution of the staff at the registries.
- The Surveillance and Risk Assessment Division, Centre for Chronic Disease Prevention and Control (CCDPC), Health Canada, produced the estimates, trends, projections, tables and figures for all sections of the document. Other analyses include producing the probabilities of developing and dying of cancer, calculations of premature mortality, and the contribution of risk factors to cancer. Les Mery of Health Canada contributed to the section on childhood cancer statistics.
- The Health Statistics Division, Statistics Canada, provided data for development of the tables and figures and several sections of the text.
- The Scientific Publication and Multimedia Services unit, Business Integration and Information Services Directorate, Health Canada, was responsible for the actual production of the monograph.
- Michel Beaupré of the Fichier des tumeurs du Québec and Ghislaine Villeneuve of Statistics Canada reviewed the French translation.
- Mary McBride of the Division of Epidemiology and Cancer Prevention, B.C. Cancer Agency, provided the estimates for non-melanoma skin cancer.
- The National Cancer Institute of Canada and the Canadian Cancer Society provided administrative support to produce, print and distribute this report. The work of Monika Dixon in particular is acknowledged.
- The Canadian Cancer Society distributes this monograph.
- The National Cancer Institute of Canada supports the work of the Steering Committee and the publication of the monograph with charitable funds collected by volunteers of the Canadian Cancer Society.

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For general information regarding cancer statistics or any other aspect of cancer (such as cancer prevention, screening, diagnosis, treatment and care, etc.), contact the **Canadian Cancer Society's (CCS) Cancer Information Service at 1-888-939-3333.** A list of the offices of the CCS – the National Office and the Divisional offices – is provided on page 10. Your local CCS office is listed in the white pages of the telephone directory.

For information regarding cancer research sponsored by the **National Cancer Institute of Canada (NCIC)**, with funds provided by the CCS and The Terry Fox Foundation, contact the NCIC at the address provided on page 10.

For Information from Health Canada:
More detailed information on methodology is available from the Surveillance and Risk Assessment Division, Health Canada, Tunney's Pasture, Ottawa, Ontario, K1A 0L2. Tel. (613) 952-3335, Fax. (613) 941-2057.

Cancer Surveillance On-Line is an interactive, Web-based tool for easy access to cancer surveillance data. It allows the user to generate data according to choice of parameters such as cancer site, geographic area, period of time and choice of presentation mode such as tables, charts and maps. See the Health Canada Website noted below for the URL.

For Information from Statistics Canada:
Detailed standard tables or custom tabulations are available on a cost recovery basis upon request from the Health Statistics Division, Statistics Canada, National Enquiries Line: 1-800-263-1136; Health Statistics Division: (613) 951-1746. Analytical articles appear regularly in *Health Reports*, Statistics Canada, Catalogue 82-003, quarterly.

For Information from the Provincial Cancer Registries:
Cancer incidence data are supplied to Statistics Canada by provincial/territorial cancer registries. Detailed information regarding the statistics for each province or territory is available from the relevant registry. (See pages 8 and 9 for addresses, telephone numbers, fax numbers and Websites.)

Data contained in this document are available on the CCS and NCIC Websites at (http://www.cancer.ca) or (http://www.ncic.cancer.ca). Additional information is also available from:

- Canadian Cancer Society (CCS)
  (http://www.cancer.ca)
- National Cancer Institute of Canada (NCIC)
  (http://www.ncic.cancer.ca)
- Health Canada
  (http://www.hc-sc.gc.ca/pphb-dgspsp/dca-acd/) (select cancer button)
- Statistics Canada
  (http://www.statcan.ca)
- Canadian Strategy for Cancer Control
  (http://www.cancercontrol.org)
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This monograph is published by the Canadian Cancer Society and the National Cancer Institute of Canada in collaboration with Health Canada, Statistics Canada, provincial/territorial cancer registries as well as university-based and provincial/territorial cancer agency-based researchers. It is part of an annual series that began publication in 1987.

The main purpose of the publication is to provide health professionals, researchers and policy-makers with detailed information regarding the incidence and mortality of the most common types of cancer by age, gender, time period and province or territory. It is hoped that these data will stimulate new research and assist decision-making and priority-setting processes at the individual, community, provincial/territorial and national levels. The monograph is also used by educators, the media and members of the public with an interest in cancer.

Special Topics are included each year, and topics from 1997 onwards are available on the Canadian Cancer Society's Website (www.cancer.ca); hard copies of previous Special Topics can be obtained by writing to (stats@cancer.ca). To see a summary of previous Special Topics please refer to *Appendix III*. This year the Special Topic is non-Hodgkin's lymphoma.

Information on cancer incidence and mortality comes from the provincial and territorial cancer registries and offices of vital statistics, which send their data to Statistics Canada for compilation at the national level. The process of collecting complete information about cancer cases in each province/territory and then compiling this information at the national level results in a considerable delay before reliable information for a particular year is available for all of Canada. This report contains actual rates and frequencies up to the most recent year for which complete data were available at the time of writing (1998 for incidence and 1999 for mortality) and, in addition, estimated values for the years up to 2003. The estimates are made in the following way: first, time trends in the known rates are examined; second, these trends are projected to the present time to obtain current rate estimates; and third, these rate estimates for the current year are applied to current population estimates.

The statistical methodology used for publication in recent years has involved the standardization of incidence and mortality rates on the basis of the 1991 Canadian population rather than the World Standard Population. Age-standardized rates are higher with this methodology because the Canadian population has a higher proportion of older people, among whom cancer is more common. Standardization using the Canadian population provides results that are more relevant and useful to those concerned with cancer in Canada. **It should be noted that it is not appropriate to compare the age-standardized rates presented here with those from publications that employ a different standard population.**

Details of the statistical methods used to produce the projections are described in *Appendix II: Methods*. **It is important to emphasize that the figures provided for 2003 are estimates, rather than actual data.**

The statistics contained herein refer to all types of cancer, defined according to the standardized classification that is used worldwide. As is customary in reports from cancer registries, the statistics exclude skin cancers other than melanoma. Benign tumours and carcinoma in situ are also excluded. Details of how cancer sites are classified and definitions of technical terms are provided in the *Glossary*.

Individuals who require additional information can refer to the section entitled *For Further Information*, which indicates how to contact the various agencies involved, including Health Canada, Statistics Canada, the Canadian Cancer Society, the National Cancer Institute of Canada, and provincial and territorial cancer registries.

Related information can also be found in other publications, including reports from provincial and territorial cancer registries; *Cancer Incidence in Canada, 1969-1993*,[1] and *Health Reports*, published by Statistics Canada; *Chronic Diseases in Canada* and the *Canadian Cancer Incidence Atlas*,[2] published by Health Canada; a collaborative monograph entitled *The Making of the Canadian Cancer Registry*; *Cancer Incidence in North America*,[3] published by the North American Association of Central Cancer Registries; and *Cancer Incidence in Five Continents*,[4] published by the International Agency for Research on Cancer.

The development of this publication over the years has benefited considerably from the comments and suggestions of readers. **The Steering Committee appreciates and welcomes such comments, including ideas on how the report can be improved** (an *Order and Evaluation Form* is included on pages 103 and 104). Finally, **readers can be included on the mailing list for next year's publication** by completing the *Order and Evaluation Form*.

Current Incidence and Mortality

- An estimated 139,900 new cases of cancer and 67,400 deaths from cancer will occur in Canada in 2003.
- In 2003 the most frequently diagnosed cancers will continue to be breast cancer for women and prostate cancer for men.
- Lung cancer remains the leading cause of cancer death for both genders.
- Overall, colorectal cancer is the second leading cause of death from cancer.

Geographic Patterns of Cancer Occurrence

- Generally, both incidence and mortality rates are higher in eastern provinces and lower in western provinces.
- Lung cancer rates continue to be higher in eastern Canada than in western Canada.

Trends in Incidence and Mortality

- Among men, the cancer mortality rate for all cancers combined has declined by 12% since 1988.
- Among women, if lung cancer is excluded, there has been a 21% decline in mortality rates for all cancers combined since 1974.
- Mortality rates for prostate cancer peaked between 1991 and 1995 and have fallen since.
- Mortality rates due to lung cancer continue to increase in women.
- Mortality rates for breast cancer have declined steadily since 1986.
- Both incidence and mortality rates for colorectal cancer have declined steadily since the mid 1980s.
- Thyroid cancer has the most rapidly increasing incidence rate among both men and women.

Age and Gender Distribution of Cancer

- Among men, 75% of new cancer cases and 82% of deaths due to cancer occur among those who are at least 60 years old.
- Among women, 63% of new cases and 78% of cancer deaths occur among those who are at least 60 years old.

Probability of Developing/Dying from Cancer

- Based on current incidence rates, during their lifetimes 38% of Canadian women and 41% of Canadian men will develop cancer.

Potential Years of Life Lost Due to Cancer

- Lung cancer is by far the leading cause of premature death due to cancer.
- Smoking is responsible for about one-third of potential years of life lost (PYLL) due to cancer.

HIGHLIGHTS

Prevalence

- The overall prevalence of cancer in the Canadian population is approximately 2% among men and 2.5% among women.
- Just under 1% of the female population are survivors of breast cancer and just over 0.5% of the male population are survivors of prostate cancer.

Cancer in Children

- The most common childhood cancer is leukemia, which accounts for over 26% of new cases and 32% of deaths.

Non-Hodgkin's Lymphoma (NHL)

- NHL incidence rates have almost doubled since 1974.
- NHL incidence rates are highest in North America, Australia and New Zealand.

The importance of different types of cancer in Canada in 2003 can be measured in three ways, as shown in Table 1. Incidence is expressed as the number of new cases of a given type of cancer diagnosed per year. Mortality is expressed as the number of deaths attributed to a particular type of cancer during the year. The deaths to cases ratio (the number of deaths divided by the number of new cases) is a crude indicator of disease severity. The closer a value is to 1.0, the poorer the prognosis for that cancer. Frequencies listed in Tables 1 to 11 are estimates based on modelling trends in cancer and population data since 1986 for both cancer incidence and mortality (an exception was made for prostate cancer; see *Appendix II* for details). These estimates are rounded to the nearest 5, 10, 50 or 100. Readers requiring actual data or information on less common sites of cancer may refer to Tables A1 and A6 in *Appendix I* or to source publications.[1-4]

Some problems that may be inherent in using these statistics are considered below.

Sources of Data

Incidence figures collected by provincial and territorial cancer registries are reported to the Canadian Cancer Registry (CCR) maintained by Statistics Canada, beginning with cases diagnosed in 1992. The patient-oriented CCR has evolved from the event-oriented National Cancer Incidence Reporting System, which collected data from 1969 to 1991. The CCR is regularly updated; it is internally linked to track patients with tumours diagnosed in more than one province, and its records are linked to death certificates. Data from these series are published by Statistics Canada,[1] the North American Association of Central Cancer Registries,[3] the International Agency for Research on Cancer every five years[4] and in occasional reports.[1,2]

Every effort is made to count all newly diagnosed cases of cancer among people who reside in a given province at the time of diagnosis, and to accurately and consistently record, for each case, the site and histological type of cancer from pathology reports and other records, according to definitions in the CCR Data Dictionary. Cancer sites included in this report are defined according to the groupings listed in the *Glossary*. Although the provincial/territorial cancer registries strive, through the Canadian Council of Cancer Registries and its Standing Committee on Data Quality, to achieve uniformity in defining and classifying new cases, reporting procedures and completeness still vary across the country. This is particularly true for skin cancer (other than melanoma), which occurs frequently but is difficult to register completely because it is usually treated successfully without requiring hospitalization or the review of a pathologic specimen. **For this reason, all tables in this monograph exclude the estimated 75,000 cases of non-melanoma skin cancer for Canada in 2003.*** Registration levels for cancer have become more comparable across the country, particularly in the period starting in the early 1980s, as registries standardized their procedures for case-finding, including linkage to provincial mortality data files.

Cancer mortality statistics are derived from death records maintained by the provincial and territorial registrars of vital statistics for people residing in that province or territory at the time of death. Cancer deaths are those attributed to some form of cancer as the underlying cause of death by the certifying physician.

* *The number of new cases of non-melanoma skin cancer is estimated using incidence rates from the cancer registry in British Columbia, which is considered to have the most complete data. Please refer to Appendix II: Methods for further details.*

Although these procedures have been standardized both nationally and internationally, some lack of specificity and uniformity is inevitable. The description of the type of cancer provided on the death certificate is usually less precise than that obtained by the cancer registries from hospital and pathology records. These facts may help to account in part for the number of cases and deaths listed under "all other sites" throughout the Tables. Cancer deaths occurring in a given year will usually be the result of cancers diagnosed in previous years.

Estimates for Cancer Incidence and Mortality, Canada, 2003

An estimated 139,900 new cases of cancer and 67,400 deaths from cancer will occur in Canada in 2003. Men outnumber women for both new cases and deaths, by 3.9% for incidence and 13.3% for mortality (Table 1).

Three types of cancer account for at least 50% of the new cases in each gender: prostate, lung, and colorectal cancers in males, and breast, lung, and colorectal cancers in females. Thirty percent of the cancer deaths in men and 25% in women are due to lung cancer alone (Figures 1.1 and 1.2). Comparisons between this year and other years with respect to colorectal cancer should be made with caution because of a change in classification practices (see *Appendix II* for further details).

Lung cancer will continue as the leading cause of cancer death in Canadian women in 2003, accounting for an estimated 7,900 deaths, as compared with the 5,300 deaths expected for breast cancer. This reflects the rapid increase in lung cancer mortality rates among women over the past three decades, while age-standardized breast cancer mortality rates declined slightly. Lung cancer incidence among women also continues to rise. With an estimated 9,000 new cases, lung cancer is the second leading form of cancer in women, ahead of the 8,300 new cases expected for colorectal cancer, which ranks third. Breast cancer continues to lead in incidence among Canadian women, with more than twice as many new cases as lung cancer.

In Canadian men in 2003, prostate cancer will continue as the leading form of cancer diagnosed, with an estimated 18,800 newly diagnosed cases, as compared with 12,200 lung cancers. The rapid increase in the number of prostate cancers detected in all provinces in the early 1990s resulted from the widespread rise in the use of earlier detection techniques. The projected number of new prostate cancer cases was derived from a Poisson regression model using data from 1991 to the most recent year of incidence data available (see *Appendix II: Methods*).

Lung cancer will remain the leading cause of cancer death in Canadian men in 2003; the estimated 10,900 lung cancer deaths far exceed the 4,400 deaths due to colorectal cancer, the second leading cause of cancer death in men.

Deaths to Cases Ratio

The ratio of deaths to new cases, at 48% overall, is slightly higher in males than in females. On the basis of these ratios, the cancer sites listed in Table 1 could be classified arbitrarily into three groups: those with a very good prognosis (a ratio of 30% or less – breast, prostate, melanoma, body of the uterus, thyroid, Hodgkin's disease, testis and male bladder); those with a fairly good prognosis (a ratio greater than 30% but less than 50% – male breast, colorectal, non-Hodgkin's lymphoma, female bladder, kidney, oral, cervix and larynx); and those with a poor prognosis

(ratio greater than 50% – lung, leukemia, pancreas, stomach, ovary, brain, multiple myeloma and esophagus).

Breast cancer and prostate cancer remain the most frequent cancers; lung cancer remains the most frequent cause of death from cancer.

Table 1

Estimated New Cases and Deaths for Cancer Sites by Gender, Canada, 2003

	New Cases 2003 Estimates			Deaths 2003 Estimates			Deaths/Cases Ratio 2003 Estimates		
	Total	M	F	Total	M	F	Total	M	F
All Cancers	**139,900**	**71,300**	**68,600**	**67,400**	**35,800**	**31,600**	**0.48**	**0.50**	**0.46**
Lung	21,100	12,200	9,000	18,800	10,900	7,900	0.89	0.90	0.88
Breast	21,200	140	21,100	5,300	40	5,300	0.25	0.31	0.25
Prostate	18,800	18,800	–	4,200	4,200	–	0.22	0.22	–
Colorectal	18,000	9,800	8,300	8,300	4,400	3,800	0.46	0.45	0.47
Non-Hodgkin's Lymphoma	6,400	3,500	3,000	2,800	1,550	1,300	0.44	0.44	0.45
Bladder	5,000	3,700	1,300	1,550	1,100	460	0.31	0.29	0.34
Kidney	4,100	2,600	1,500	1,450	920	550	0.36	0.35	0.36
Melanoma	3,900	2,100	1,800	840	510	330	0.22	0.25	0.18
Body of Uterus	3,700	–	3,700	700	–	700	0.19	–	0.19
Leukemia	3,600	2,100	1,550	2,200	1,300	940	0.61	0.62	0.61
Pancreas	3,300	1,550	1,700	3,200	1,550	1,700	0.99	0.99	0.98
Oral	3,100	2,100	1,000	1,100	730	360	0.35	0.35	0.36
Stomach	2,800	1,800	990	1,900	1,150	740	0.69	0.65	0.75
Ovary	2,600	–	2,600	1,550	–	1,550	0.61	–	0.61
Brain	2,400	1,350	1,100	1,600	900	700	0.66	0.68	0.63
Thyroid	2,100	550	1,550	170	60	120	0.08	0.11	0.08
Multiple Myeloma	1,800	1,000	800	1,250	670	570	0.68	0.66	0.70
Esophagus	1,400	1,000	410	1,500	1,100	400	1.08'	1.11'	0.99
Cervix	1,400	–	1,400	420	–	420	0.31	–	0.31
Larynx	1,200	990	230	510	420	90	0.42	0.42	0.39
Hodgkin's Disease	860	470	390	120	70	55	0.14	0.14	0.14
Testis	800	800	–	35	35	–	0.05	0.05	–
All Other Sites	10,400	5,000	5,400	7,800	4,200	3,500	0.74	0.84	0.66

– Not applicable

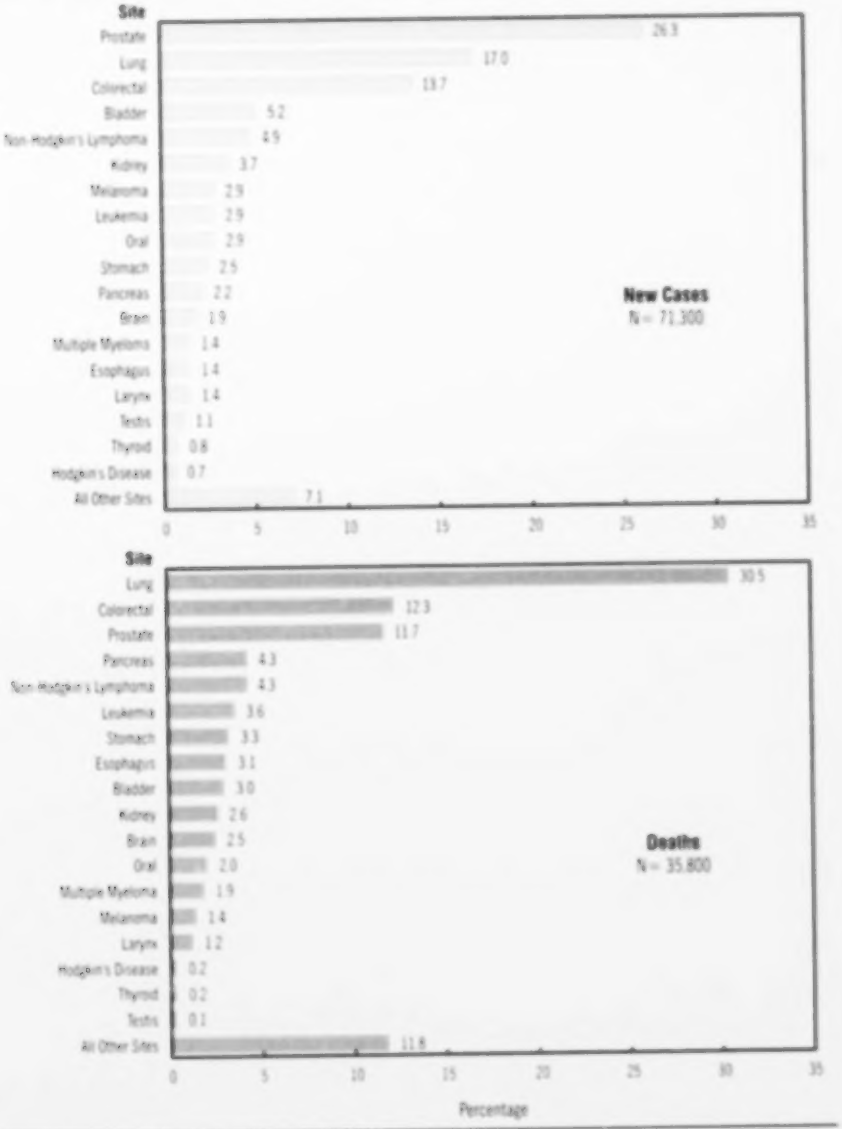
' The high ratio (in excess of 1.0) for cancer of the esophagus may result from incomplete registration of this cancer before death. Please refer to *Appendix II: Methods* for further details.

Note: Incidence figures exclude an estimated 75,000 new cases of non-melanoma skin cancer (ICD-9 173). Total of rounded numbers may not equal rounded total number. Please refer to *Appendix II: Methods* for further details.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 1.1

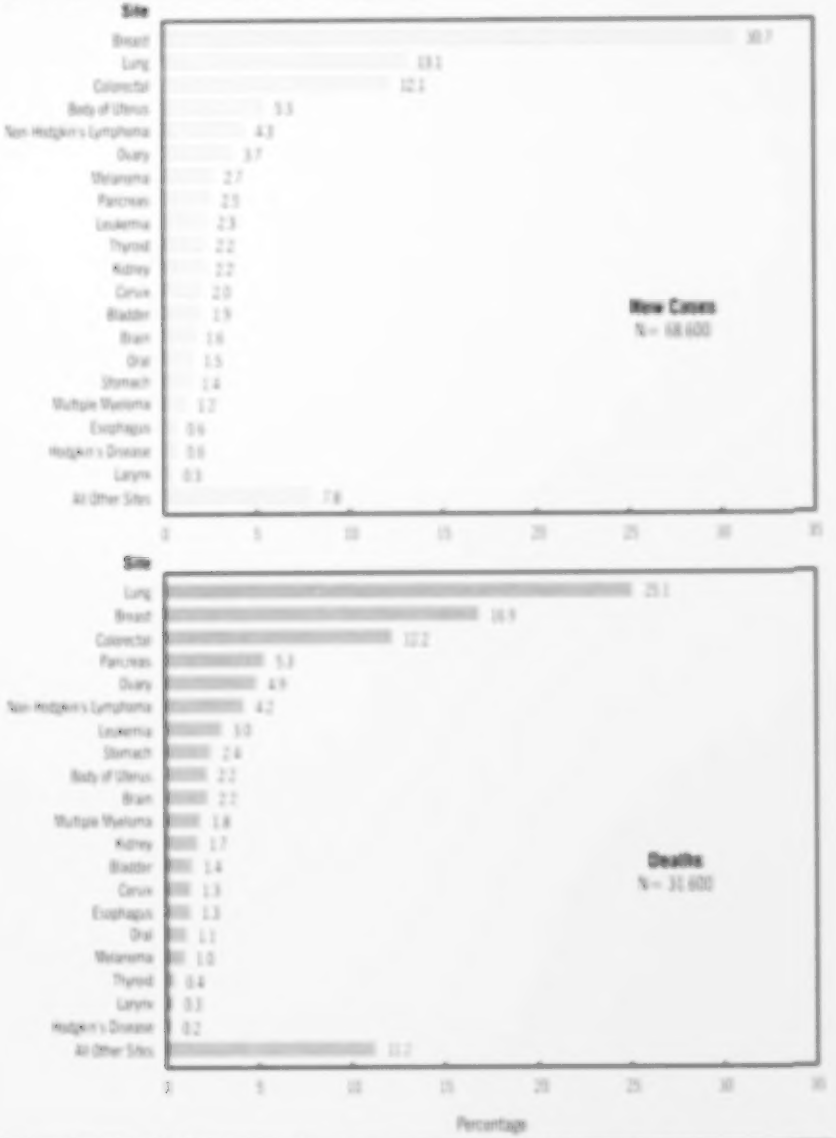
Percentage Distribution of Estimated New Cases and Deaths for Selected Cancer Sites, Males, Canada, 2003



Note: Incidence figures exclude an estimated 75,000 new cases of non-melanoma skin cancer (ICD-9 173).
Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 1.2

Percentage Distribution of Estimated New Cases and Deaths for Selected Cancer Sites, Females, Canada, 2003



Note: Incidence figures exclude an estimated 75,000 new cases of non-melanoma skin cancer (ICD-9 173).
Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Table 2 presents population projections and estimates of new cases and deaths for all cancer sites combined, by gender and province or territory for 2003. Tables 3 and 4 present estimates of the number of new cases and the age-standardized incidence rates for each of the major cancer sites, by gender and province territory for 2003. The age-standardized estimates take into consideration the differences in provincial territorial age distributions, thus facilitating inter-provincial comparisons. Similarly, Tables 5 and 6 present estimates of the number of deaths and the age-standardized mortality rates for each of the major cancer sites, by gender and province territory for 2003. The calculation of standardized rates using the 1991 Canadian population as the standard is described in the *Glossary*. Adjustments were necessary for estimated incident cases in most provinces territories. For the first time, estimated age-standardized rates were calculated directly from the case estimates as described in *Appendix II: Methods*.

Tables A3 to A6 in *Appendix I* provide the most recent actual data across the provinces territories.

Data on provincial territorial numbers and rates of incident cancer cases and cancer deaths provide valuable information for research, knowledge synthesis, planning and decision-making at the provincial territorial level. These data are therefore of interest to researchers, health care workers, planners and policy-makers. Inevitably, these data will be used for inter-provincial comparisons. Although the incidence rates for some cancers (e.g. breast) appear to be reasonably consistent across jurisdictions, the rates for others (e.g. prostate, lung) appear to vary more widely. In Quebec, because of the registry's dependence on hospital data, the estimated number of prostate, melanoma and bladder cases is underreported by an estimated 32%, 35% and 14% respectively. The Quebec tumour registry is aware of this and is taking steps to correct the problem. Interpretation of these inter-provincial variations must be done with caution because a variety of reasons could account for the observations.

First, if the cancer is rare, the number of cases occurring annually in a given province/territory may be so small that estimates may be unreliable and vary considerably from one year to the next.

Second, correlations found between the incidence of disease and the prevalence of risk factors for a given geographic location can be misleading. Proof of a causal association between a risk factor and a disease requires more detailed studies of individuals. However, different patterns of tobacco consumption among the provinces contribute to some of the variation, as demonstrated by the higher lung cancer rates in eastern Canada.

Third, for many cancers there is a long interval between exposure to a risk factor and the occurrence of disease, and often the information on the prevalence of risk factors from previous decades is inadequate. Lower socio-economic status has been associated with higher cancer mortality in general, and with increased incidence of certain cancers (e.g. cervical) but decreased incidence of others.

Fourth, the availability of and the completeness in target populations of screening programs (e.g. for breast and cervical cancer) differ among provinces territories. The year of initiation of screening programs differs by province territory, and cancer rates will be altered temporarily through identification of previously undiagnosed cases in asymptomatic individuals. As well, the availability of diagnostic procedures may differ regionally.

Finally, there are differences in the reporting procedures used in cancer registration (e.g. registration of second primary cancers and use of death certificates – see *Appendix II* regarding cancer registry methodology). For example, death certificate information has not been available for registry purposes in Newfoundland, and this falsely lowers the number of incident cases with short life expectancy, such as cases of lung and pancreatic cancer. The degree to which death certificate information is actively followed back to hospital records also varies in different provinces/territories, and this affects the accuracy of incident data.

Even with these cautions, it should be noted that Canada is one of the few nations where cancer patterns can be monitored for the whole population. The provincial/territorial and national cancer registries are important resources for making comparisons that generate hypotheses warranting further investigation. Where true differences in cancer risk and causal associations are demonstrated in subsequent epidemiologic studies, these findings can be used in planning cancer control programs that aim to reduce the burden of cancer.

Generally, both incidence and mortality rates are higher in eastern provinces and lower in western provinces.

Table 2

Estimated Population, New Cases and Deaths for All Cancers by Gender and Geographic Region, Canada, 2003

Province/Territory	Population (000s) 2003 Estimates[1]			New Cases 2003 Estimates[2]			Deaths 2003 Estimates		
	Total	M	F	Total	M	F	Total	M	F
Canada	**31,949**	**15,814**	**15,834**	**136,900**	**71,300**	**68,600**	**67,400**	**35,800**	**31,600**
Newfoundland	527	260	266	2,100	1,200	950	1,250	710	540
Prince Edward Island	139	68	71	680	360	320	330	180	150
Nova Scotia	943	462	482	5,700	2,800	2,400	2,500	1,350	1,150
New Brunswick	759	376	383	3,900	2,000	1,850	1,800	1,000	810
Quebec	7,451	3,675	3,775	35,500	17,900	17,600	16,200	9,800	6,400
Ontario	12,179	6,011	6,167	52,700	26,500	26,200	24,600	12,900	11,700
Manitoba	1,156	573	583	5,400	2,800	2,700	2,600	1,350	1,250
Saskatchewan	1,002	496	506	4,500	2,410	2,100	2,300	1,250	1,050
Alberta	3,155	1,591	1,564	12,000	6,200	5,800	5,200	2,700	2,500
British Columbia	4,139	2,051	2,088	17,900	9,300	8,600	8,500	4,500	4,000
Yukon	29	14	14	80	40	40	45	25	20
Northwest Territories	41	21	20	95	50	45	40	20	20
Nunavut	30	15	14	50	25	25	35	20	15

[1] 2003 population projections were provided by the Census and Demographics Branch, Statistics Canada.
[2] Figures exclude non-melanoma skin cancer (ICD-9 173).
Note: Total of rounded numbers may not equal rounded total number. Please refer to *Appendix II: Methods*.
Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada.

Table 3

Estimated New Cases for Major Cancer Sites by Gender and Province, Canada, 2003

	New Cases										
	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Males											
All Cancers	**71,300**	**1,200**	**360**	**2,600**	**2,000**	**17,900**	**26,500**	**2,800**	**2,400**	**6,200**	**9,300**
Prostate	18,800	390	100	760	560	3,600	7,200	730	760	2,000	2,700
Lung	12,200	190	65	490	390	4,000	4,000	430	340	880	1,400
Colorectal	9,800	220	50	360	260	2,400	3,600	390	320	790	1,250
Bladder	3,700	35	15	170	120	1,400	1,100	160	150	200	380
Non-Hodgkin's Lymphoma	3,500	40	20	120	90	870	1,350	130	110	290	470
Kidney	2,600	40	15	90	75	630	1,050	140	70	230	290
Oral	2,100	60	10	70	55	510	790	110	65	170	250
Melanoma	2,100	20	15	100	60	300	820	70	60	250	360
Leukemia	2,100	20	10	50	60	500	800	80	90	220	240
Stomach	1,800	65	10	55	50	460	660	65	55	140	220
Pancreas	1,550	15	10	50	45	440	530	65	45	130	240
Brain	1,350	25	5	40	35	350	500	45	40	120	170
Multiple Myeloma	1,000	10	5	30	25	280	410	40	25	65	130
Larynx	990	20	5	30	30	340	340	35	30	60	110
Females											
All Cancers	**68,600**	**950**	**320**	**2,400**	**1,850**	**17,600**	**26,200**	**2,700**	**2,100**	**5,800**	**8,600**
Breast	21,100	330	95	700	500	5,400	8,000	830	610	1,850	2,700
Lung	9,000	75	55	310	220	2,200	3,500	390	240	780	1,250
Colorectal	8,300	170	50	330	250	2,100	3,200	340	250	590	1,000
Body of Uterus	3,700	55	15	130	85	840	1,450	160	110	340	470
Non-Hodgkin's Lymphoma	3,000	30	10	95	85	740	1,200	110	85	240	370
Ovary	2,600	35	10	80	45	720	1,050	85	80	160	290
Melanoma	1,800	25	20	95	50	280	730	60	55	240	260
Pancreas	1,700	10	10	65	50	480	600	70	45	160	230
Thyroid	1,550	30	5	30	40	380	620	60	40	170	170
Leukemia	1,550	15	5	40	35	370	630	70	60	130	180
Kidney	1,500	20	5	60	50	410	560	70	55	140	160
Cervix	1,400	25	10	55	30	280	550	55	50	140	190
Bladder	1,300	10	5	65	40	460	380	55	55	130	120
Brain	1,100	15	5	30	25	320	430	35	35	80	120
Oral	1,000	15	5	30	20	220	390	45	35	75	160
Stomach	990	25	–	25	25	280	360	30	35	80	120
Multiple Myeloma	800	10	5	20	20	220	330	30	25	60	95

– Fewer than 3 cases

Canada totals include provincial and territorial estimates. However, territories are not listed separately because of the small numbers.

Note: Total of rounded numbers may not equal rounded total number. The Canada and provincial totals for all cancers exclude an estimated 75,000 cases of non-melanoma skin cancer (ICD-9 173). Because of changes and improvements in source data and in methodology (as described in *Appendix II: Methods*) caution is needed if the 2003 estimates are compared with previously published estimates. These estimates may vary from actual figures. Please see *Appendix I* for most current actual data or contact provincial cancer registries for further information.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Table 4

Estimated Age-Standardized Incidence Rates for Major Cancer Sites by Gender and Province, Canada, 2003

	Rate per 100,000										
	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Males											
All Cancers	**439**	**401**	**468**	**529**	**534**	**446**	**420**	**446**	**420**	**444**	**432**
Prostate	117	136	135	150	143	93	119	123	138	144	117
Lung	75	66	89	96	99	101	65	72	62	63	60
Colorectal	60	76	65	71	65	62	59	65	57	56	54
Bladder	23	13	19	33	29	35	18	26	26	15	16
Non-Hodgkin's Lymphoma	21	13	27	23	21	22	22	21	19	19	20
Kidney	16	13	20	17	18	15	16	23	13	15	12
Leukemia	13	8	12	10	15	13	13	13	16	15	11
Oral	12	21	12	13	13	12	12	18	12	11	11
Melanoma	12	7	21	20	14	7	13	11	11	16	15
Stomach	11	23	14	11	13	12	11	11	9	10	10
Pancreas	10	5	14	9	12	11	8	11	8	9	10
Brain	8	9	6	8	8	9	8	8	8	8	8
Larynx	6	7	8	5	6	8	5	6	5	4	5
Multiple Myeloma	6	4	6	6	6	7	7	6	4	4	5
Females											
All Cancers	**348**	**290**	**356**	**383**	**368**	**354**	**351**	**366**	**323**	**348**	**323**
Breast	107	98	107	112	101	110	107	116	99	109	103
Lung	45	23	61	49	44	43	46	54	38	48	47
Colorectal	40	51	54	46	47	40	40	42	34	35	35
Body of Uterus	19	17	18	21	17	17	20	23	18	21	18
Non-Hodgkin's Lymphoma	15	10	11	15	17	15	16	15	13	15	14
Ovary	13	10	10	13	10	15	14	12	13	10	11
Melanoma	10	8	23	16	12	6	10	9	10	15	10
Thyroid	9	9	5	5	9	10	10	10	8	10	7
Pancreas	8	3	9	9	9	9	8	8	6	9	8
Cervix	8	8	10	10	8	7	8	9	9	8	8
Kidney	8	7	8	9	10	8	7	9	8	8	6
Leukemia	8	6	7	6	7	7	8	10	9	8	7
Bladder	6	3	3	9	8	9	5	7	8	8	4
Brain	6	4	5	6	6	7	6	6	6	5	5
Oral	5	5	5	5	4	4	5	6	5	5	6
Stomach	5	8	2	4	5	5	5	4	5	5	4
Multiple Myeloma	4	3	3	3	4	4	4	4	3	3	3

[1] Canada totals include provincial and territorial estimates. However, territories are not listed separately because of the small numbers.

Note: Rates exclude non-melanoma skin cancer (ICD-9 173) and are adjusted to the age distribution of the 1991 Canadian population. As a result of changes and improvements in source data and in methodology (as described in *Appendix II: Methods*), caution is needed if the 2003 estimates are compared with previously published estimates. These estimates may vary from actual figures.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Table 5

Estimated Deaths for Major Cancer Sites by Gender and Province, Canada, 2003

	Deaths										
	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Males											
All Cancers	**35,800**	**710**	**180**	**1,350**	**1,000**	**9,800**	**12,900**	**1,350**	**1,250**	**2,700**	**4,500**
Lung	10,900	230	60	440	350	3,600	3,500	370	340	750	1,250
Colorectal	4,400	95	25	150	120	1,250	1,600	180	160	330	510
Prostate	4,200	80	20	160	120	890	1,600	170	230	390	550
Pancreas	1,550	30	10	60	45	410	550	60	55	120	220
Non-Hodgkin's Lymphoma	1,550	15	5	70	45	330	600	75	45	110	220
Leukemia	1,300	15	5	40	30	290	510	50	45	120	160
Stomach	1,150	45	5	35	40	360	400	40	35	70	140
Bladder	1,100	20	5	40	30	270	400	45	50	80	160
Kidney	920	20	5	35	25	250	310	45	30	70	120
Brain	900	15	–	30	20	270	300	35	30	80	110
Oral	730	15	5	30	20	210	260	30	15	60	90
Multiple Myeloma	670	10	5	25	20	180	250	25	25	40	90
Melanoma	510	5	–	25	10	80	240	20	10	35	80
Larynx	420	5	–	15	15	150	130	15	15	25	40
Females											
All Cancers	**31,600**	**540**	**150**	**1,150**	**810**	**8,400**	**11,700**	**1,250**	**1,050**	**2,500**	**4,000**
Lung	7,900	120	35	330	170	2,300	2,800	260	200	630	1,100
Breast	5,300	95	25	210	140	1,450	2,000	220	150	430	640
Colorectal	3,800	90	25	180	100	1,100	1,400	160	120	230	420
Pancreas	1,700	25	10	65	45	430	590	70	65	150	230
Ovary	1,550	35	5	50	35	380	580	60	55	130	210
Non-Hodgkin's Lymphoma	1,300	15	5	55	35	300	520	65	50	85	170
Leukemia	940	15	5	35	20	200	380	40	35	75	130
Stomach	740	30	–	25	15	240	240	20	25	60	80
Body of Uterus	700	10	5	30	20	190	270	30	20	55	75
Brain	700	10	5	20	20	210	230	25	20	55	95
Multiple Myeloma	570	10	5	20	15	150	220	25	20	45	65
Kidney	550	10	5	15	20	160	160	25	25	50	70
Bladder	460	10	–	15	15	120	160	20	15	30	65
Cervix	420	10	5	20	10	90	160	15	15	50	50
Oral	360	5	–	10	5	85	150	15	10	30	40
Melanoma	330	5	–	10	5	55	160	10	10	25	45

– Fewer than 3 deaths

Canada totals include provincial and territorial estimates. However, territories are not listed separately because of the small numbers.

Note: Total of rounded numbers may not equal rounded total number. As a result of changes and improvements in source data and in methodology (as described in *Appendix II: Methods*), caution is needed if the 2003 estimates are compared with previously published estimates. These estimates may vary from actual figures.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Table 6

Estimated Age-Standardized Mortality Rates for Major Cancer Sites by Gender and Province, Canada, 2003

	Rate per 100,000										
	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Males											
All Cancers	**224**	**267**	**249**	**267**	**254**	**257**	**214**	**222**	**217**	**199**	**193**
Lung	68	87	80	87	87	93	58	61	61	54	53
Colorectal	28	35	32	30	30	33	26	30	27	24	22
Prostate	27	33	31	33	30	26	28	27	36	31	24
Pancreas	10	10	14	12	12	10	9	10	10	9	9
Non-Hodgkin's Lymphoma	9	6	8	13	11	8	10	12	8	8	10
Leukemia	8	6	8	8	8	8	9	9	8	8	7
Stomach	7	17	9	7	10	9	7	7	6	5	6
Bladder	7	9	6	8	7	7	7	7	8	6	7
Kidney	6	7	9	7	7	6	5	7	6	5	5
Brain	5	6	2	[illegible]	5	7	5	6	6	5	5
Oral	4	6	6	5	5	5	4	5	3	4	4
Multiple Myeloma	4	4	5	5	5	5	4	4	4	3	4
Larynx	3	3	3	3	4	4	2	2	2	2	2
Melanoma	3	1	3	5	2	2	4	3	2	2	3
Females											
All Cancers	**151**	**159**	**154**	**171**	**152**	**160**	**147**	**158**	**145**	**146**	**138**
Lung	39	35	40	50	34	45	36	35	31	39	39
Breast	25	27	28	32	27	27	25	29	22	25	23
Colorectal	17	26	22	25	18	20	17	18	15	13	14
Pancreas	8	7	9	9	8	8	7	8	8	9	8
Ovary	8	11	7	8	7	7	8	8	8	8	8
Non-Hodgkin's Lymphoma	6	4	6	8	6	6	7	8	7	5	6
Brain	4	4	4	4	4	4	3	3	4	4	4
Leukemia	4	4	5	5	4	4	5	5	5	4	4
Stomach	3	9	2	3	3	4	3	3	3	3	3
Body of Uterus	3	3	3	5	4	3	3	3	3	3	3
Multiple Myeloma	3	3	3	3	3	3	3	3	2	3	2
Kidney	3	3	3	2	4	3	2	3	4	3	2
Oral	2	1	2	2	1	2	2	2	1	2	2
Melanoma	2	1	1	1	1	1	2	2	1	1	2
Cervix	2	4	4	3	2	2	2	2	3	3	2
Bladder	2	2	1	2	2	2	2	2	2	2	2

Canada totals include provincial and territorial estimates. However, territories are not listed separately because of the small numbers.

Note: Rates adjusted to the age distribution of the 1991 Canadian population. As a result of changes and improvements in source data and in methodology (as described in *Appendix II: Methods*), caution is needed if the 2003 estimates are compared with previously published estimates. These estimates may vary from actual figures.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Trends in incidence and mortality for major types of cancer are assessed by comparing annual age-standardized rates. Figures 2.1 and 2.2 present the number of new cases and deaths for Canadian men and women, together with the corresponding age-standardized rates from 1974 to 1999 and with estimates to the year 2003. Figures 2.3 and 2.4 depict the relative contribution to the change in the total number of new cases and deaths that can be attributed to changes in cancer rates, population size and the aging of the population. Detailed depictions of the trends in annual rates for selected sites over the past 30 years are presented in Figures 3.1, 3.2 and 4.1, 4.2 with the data points provided in Tables 7.1, 7.2 and 8.1, 8.2. The average annual percent changes in site-specific incidence rates (1991-1998) and mortality rates (1991-1999) are listed in Table 9 and plotted in Figure 5.

The process of age standardization permits comparisons between calendar years, since it accounts for changes that have occurred over time in the age distribution of the population. Rates in this publication have been standardized to the 1991 Canadian population. The rapid increase in incidence rates throughout the 1970s largely reflected improved registration of new cases in several provincial registries during that period. Registration levels, however, have generally stabilized since 1981 because of increasing consistency of cancer reporting procedures across Canada.[1]

All Sites

Among men, the cancer mortality rate, after reaching a peak in 1988 (Figure 2.2, Table 7.2) is declining slowly as a result of decreases in mortality rates for lung, colorectal, stomach and other cancers. In contrast, the cancer incidence rate rose slightly in the early 1990s because of the sharp increase in incidence of prostate cancer, and more recently has begun to level off or decline slightly. Among women, since 1989 cancer incidence has risen slightly whereas mortality rates have declined slightly (Figures 2.1 and 2.2, Tables 8.1, 8.2).

Figures 2.1 and 2.2 show that despite the relative stability in the age-standardized rates, the numbers of new cases and deaths continue to rise steadily as the Canadian population increases and ages. The numbers of new cases and deaths, as opposed to rates, are an important measure of cancer burden on the Canadian population and health care system. In 2003, the number of new cases is estimated to be 139,900 and the number of new deaths to be 67,400. These numbers can be used to plan patient services and health care facilities to meet the increasing demand.

Figures 2.3 and 2.4 show how changes since 1971 in the total population and in the age structure of the population have affected trends in the total number of cases and deaths. The lowest plot in these graphs represents the total number of cases (or deaths) that would have occurred each year if the rates alone had changed but the population had remained the same as in 1971. The middle line represents the number of cases (or deaths) that would have occurred each year if the annual rates had acted upon a population that grew larger but maintained the same age distribution as in 1971. The top line represents the number of cases (or deaths) that actually occurred and thus reflects the combined impact of rate change, population growth and the aging of the population. These figures demonstrate that changes in population size and age structure have been the major determinants of the increasing burden of cancer among Canadians. An important implication is that as the Canadian population continues to age and grow in size, there will be a concordant increase in the number of new cases and deaths each year.

Figure 6 plots an index (see definition in *Glossary*) of age-standardized mortality rates from 1974 to1999 for all sites combined and for all sites excluding lung cancer. Among men, lung cancer was responsible for the increase in cancer mortality rates until overall rates peaked in 1988. Since then, overall cancer mortality rates among men declined by similar percentages whether or not lung cancer rates were included. Among women, the overall cancer mortality rates remain essentially stable until 1999. It is apparent that the continuing increase in mortality from lung cancer has masked the overall decrease in cancer mortality among women.

Trends by Selected Sites

Time trends of incidence and mortality rates over a 30-year period for selected cancer sites are shown for men in Figures 3.1 and 3.2 and for women in Figures 4.1 and 4.2, with the corresponding data points tabulated in Tables 7.1, 7.2, 8.1 and 8.2. Average annual percent changes for the set of cancer sites examined in this publication are summarized in Table 9 and Figure 5. In general, incidence and mortality rates for the majority of cancer sites have stabilized or declined during the past decade, with some notable exceptions.

Among women, lung cancer incidence and mortality rates continue their increase and are now three to four times as high as rates in 1974. However, estimated rates for lung cancer incidence and mortality among women in 2003 are still much lower than those among men. Among men, lung cancer rates leveled off in the mid-1980s and have since consistently declined, reflecting men's drop in tobacco consumption beginning in the mid-1960s. Among women, smoking rates began to decline slightly only around the 1980s,[5] thus benefits in terms of declining lung cancer rates have yet to become apparent (Figure 4.1 and Table 8.1).

After years of steady increases, incidence rates of prostate cancer rose particularly sharply from 1989 to 1993 (Table 7.1). By contrast, mortality rates rose much more slowly from 1978, and have declined steadily since 1995. The increased incidence of prostate cancer before 1990 is at least partly due to increased detection of cancers following trans-urethral resection of the prostate (TURP) for suspected benign prostatic hypertrophy.[6] The sharp increase beginning in 1990 is predominantly the result of increased early detection using PSA (determination of the Prostate Specific Antigen level).[7] This rate has since then shown a decline (expected on theoretical grounds and illustrated by the experience to date in the United States[8]), probably because early detection has now exhausted the pool of prevalent cancer in the population that is screened.

Despite the sharp increase in prostate cancer incidence it is especially relevant to note that, during the period of sharp increases to 1993, there was no substantial associated increase in mortality rates. In fact since 1991, mortality rates have fallen by more than 10% from their peak. Other methods of early detection that have been considered include digital rectal examination and transrectal ultrasonography.[9] Although much of the past increase in incidence has likely been due to early detection, changes in risk or protective factors might also account for some of the increases. However, no such risk or protective factors have yet been identified that could explain these changes.

Breast cancer incidence among women also rose steadily but gradually between 1974 and 1992. This increase may be due, in part, to the rising number of mammographic examinations since the mid-1980s, but may also be affected by reproductive

patterns.[10,11] However, since 1993 incidence rates have increased more slowly, and mortality rates for breast cancer have declined steadily since 1986. The most recent actual data for 1999 showed the breast cancer mortality rate to be at its lowest since 1950.[12] Similar declines are also occurring in the United States, the United Kingdom, and Australia.[12] Further research is needed to determine the respective impact of screening, improved treatment and changes in risk or protective factors in causing this decline.

Non-Hodgkin's lymphoma has shown a steady increase in incidence and mortality. The Special Topic in this year's edition deals in more detail with the epidemiologic issues in non-Hodgkin's lymphoma.

Of all the cancers analyzed in this report, the incidence of just two cancers among men and one among women has increased at an average rate greater than 2% annually between 1991 and 1998 (Table 9 and Figure 5). These were cancers of the thyroid (+2.8%) and melanoma (+2.4%) in men, and thyroid cancer (+3.9%) in women. The increasing rate of thyroid cancer has also been noted in Europe and parts of the United States. It is postulated that improved early detection practices and technologies (ultrasound and needle biopsy) are identifying early stage thyroid cancers more frequently than was possible in the past. As modern treatment achieves normal survival in the majority of patients, it is unlikely that the mortality rate will increase to the same extent. An increase in melanoma incidence may be related to intense sunlight exposure and to improvements in the detection of the disease. Other cancers showing a significant increase, but of less than 2%, were non-Hodgkin's lymphoma in both men and women, and lung cancer and melanoma in women.

Mortality rate increases between 1991 and 1999 have been greatest for lung cancer among women, with a significant increase of 2.1% per year. In both men and women, non-Hodgkin's lymphoma (+1.7% and +0.6% respectively) showed a substantial annual increase in mortality.

Rates for other cancer sites generally declined. Incidence and mortality rates for colorectal cancer continue to be significantly lower than in 1974, although the reasons are not completely understood. Some evidence suggests that lifestyle changes such as diet may have contributed to the declines. In addition, consensus is emerging internationally about the benefits of population-based screening for colorectal cancer. This is under active consideration in Canada by the provinces. However, casual screening is already prevalent in Canada and may have contributed to the reduction in mortality rates. This effect can best be substantiated by the establishment and evaluation of organized population-based screening programs.

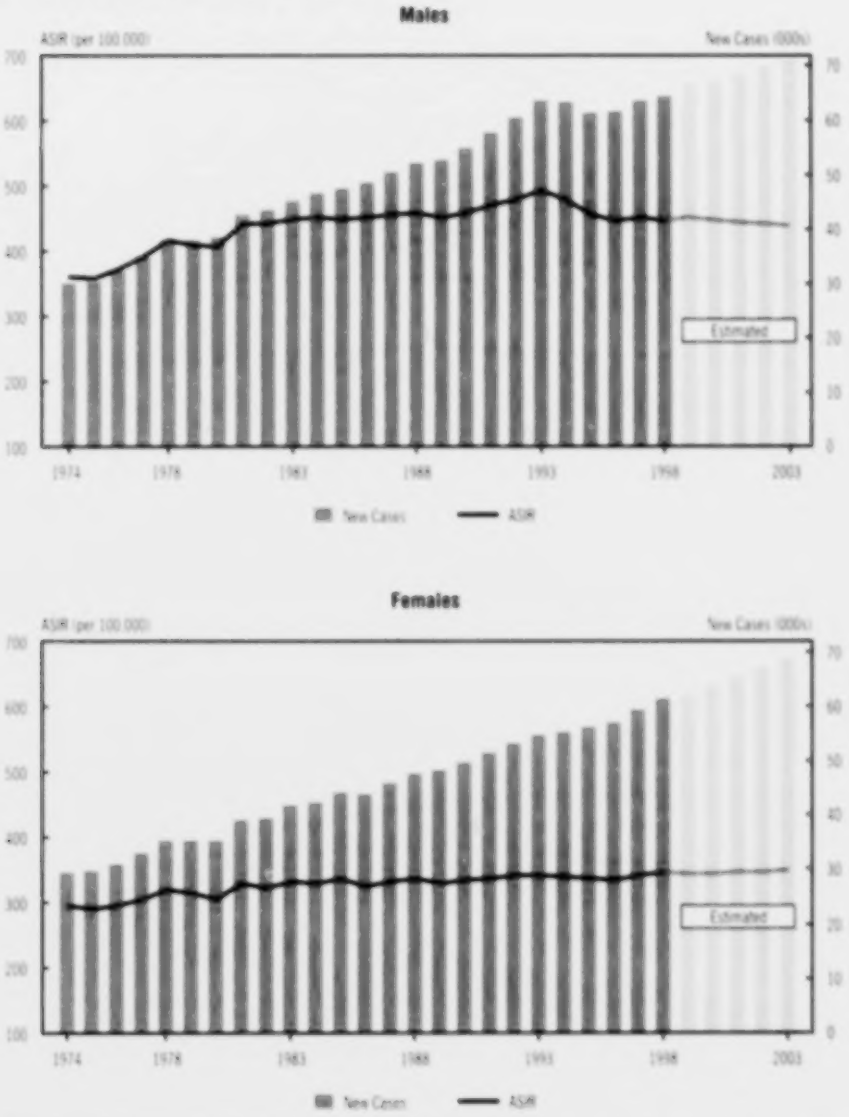
Mortality rates have dropped dramatically for Hodgkin's disease (–4.6% among men and –5.8% among women), whereas incidence declined only slightly, which suggests that treatment and survival may have improved. With regard to stomach cancer, continuing large declines in the incidence (–2.6% among men and –2.3% among women) and mortality (–2.7% among men and –3.1% among women) may reflect improved diets and control of infectious agents (e.g. *Helicobacter pylori*). Lower rates of invasive cervical cancer (–2.0% incidence and –1.7% mortality) likely reflect the impact of early detection and treatment of pre-malignant lesions through Pap smear screening and treatment of non-invasive lesions. Statistically significant declines in incidence also occurred for oral, pancreas, larynx, lung and bladder cancers; leukemia among men; and bladder cancer and leukemia among women. Likewise, statistically significant

declines in mortality rates among men have occurred in oral, pancreas, larynx and lung cancer.

Exclusive of lung cancer in women, mortality rates for most major cancers are declining.

Figure 2.1

New Cases and Age-Standardized Incidence Rates (ASIR) for All Cancers, Canada, 1974-2003

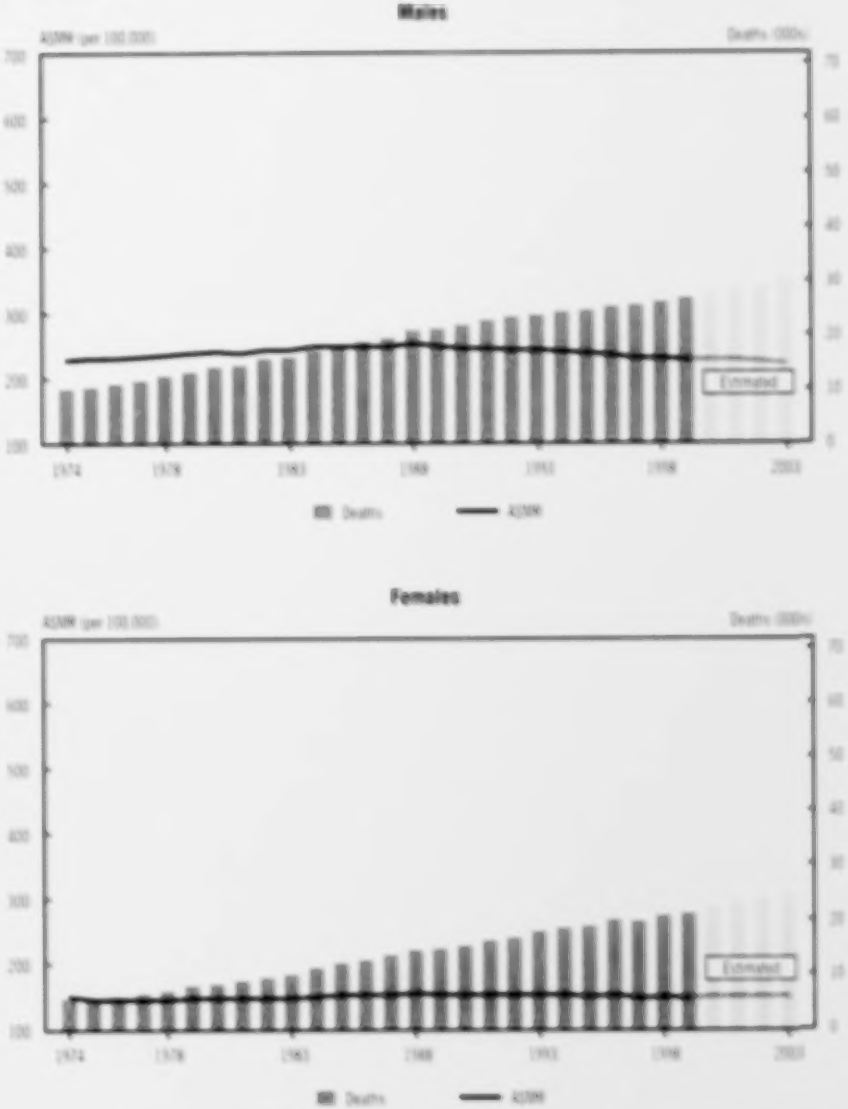


Note: All cancers exclude non-melanoma skin cancer (ICD-9 173). Rates are standardized to the 1991 Canadian population.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 2.2

Deaths and Age-Standardized Mortality Rates (ASMR) for All Cancers, Canada, 1974-2003

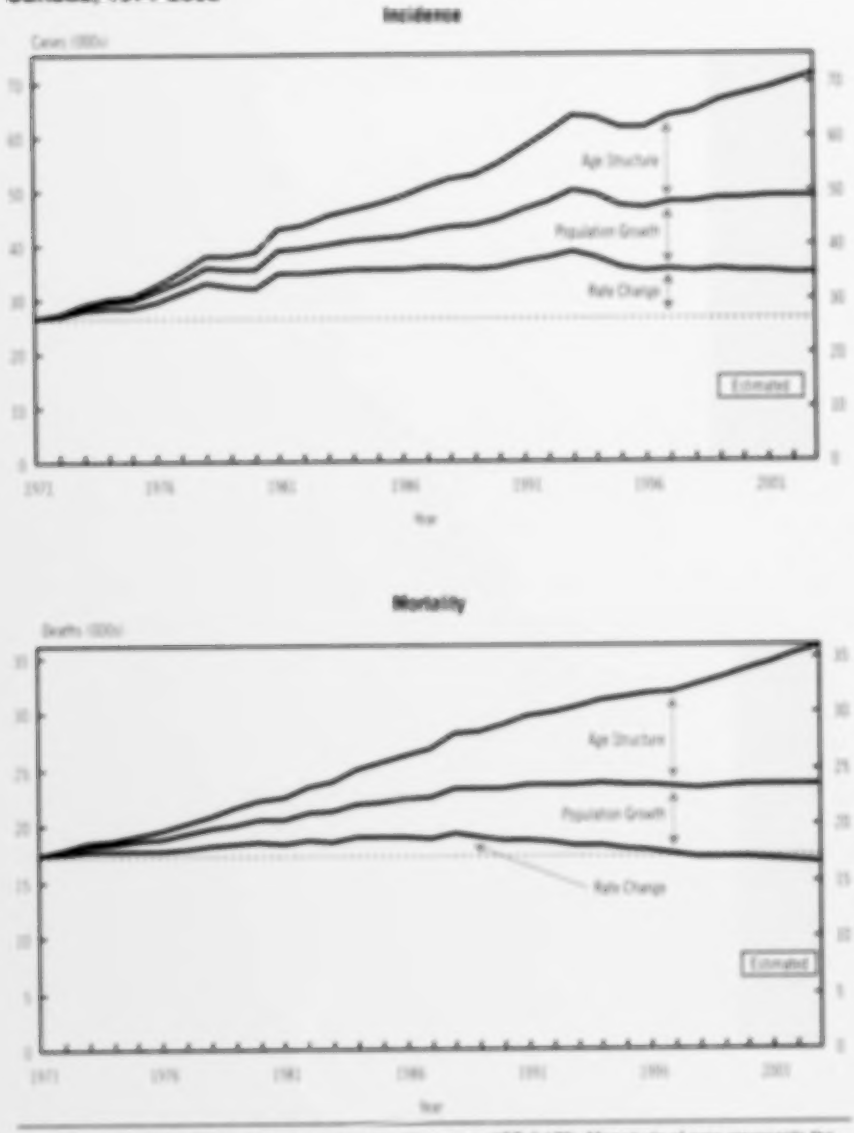


Note: All cancers exclude non-melanoma skin cancer (ICD-9 173). Rates are standardized to the 1991 Canadian population.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 2.3

Trends in New Cases and Deaths Attributed to Cancer Rate, Population Growth, and Population Age Structure, All Cancers, All Ages, Males, Canada, 1971-2003

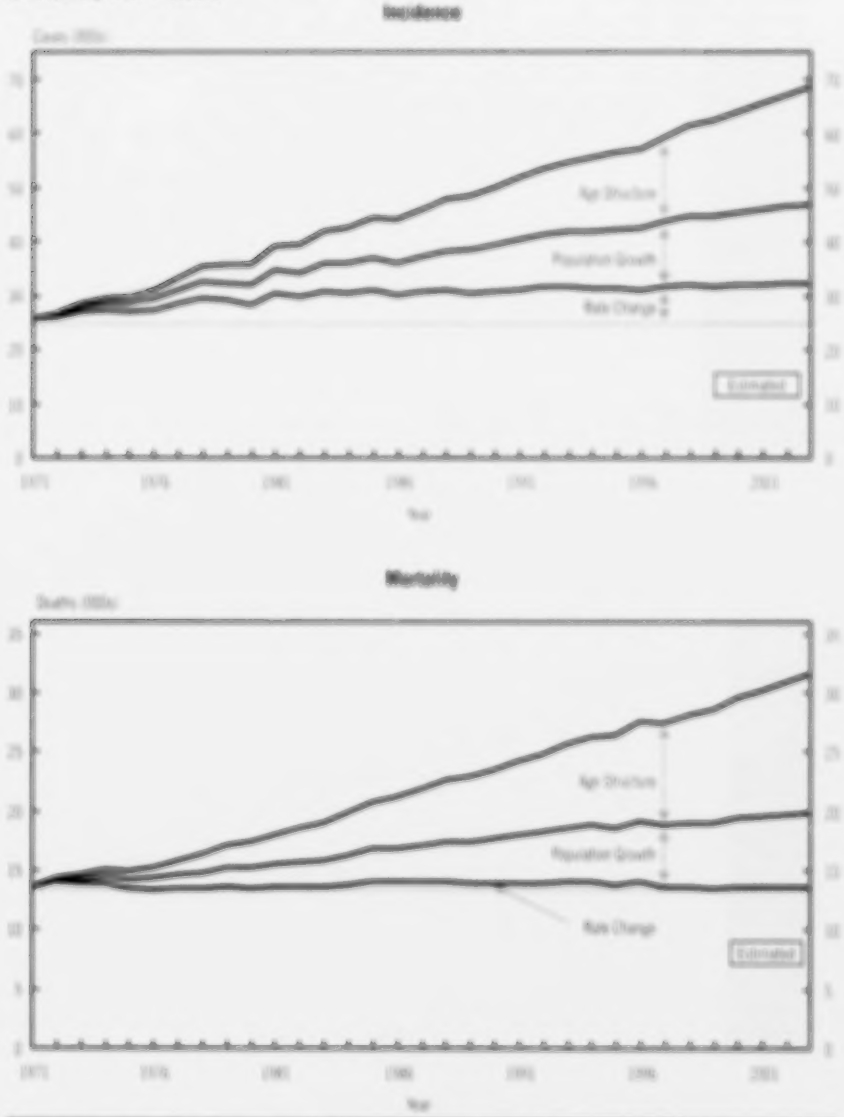


Note: Incidence figures exclude non-melanoma skin cancer (ICD-9 173). Magnitude of area represents the number of cases/deaths due to each change. Please refer to Appendix II: Methods for further details.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 2.4

Trends in New Cases and Deaths Attributed to Cancer Rate, Population Growth, and Population Age Structure, All Cancers, All Ages, Females, Canada, 1971-2003

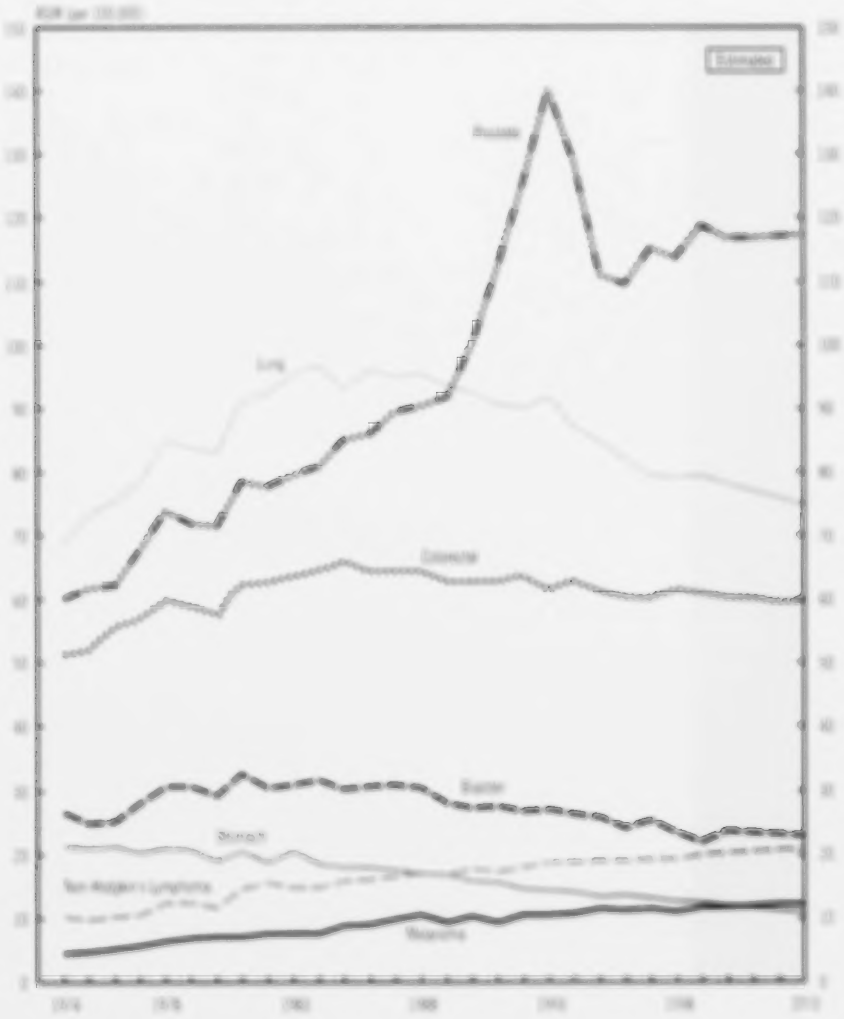


Note: Incidence figures exclude non-melanoma skin cancer (ICD-9 173). Magnitude of area represents the number of cases/deaths due to each change. Please refer to *Appendix II: Methods* for further details.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 3.1

Age-Standardized Incidence Rates (ASIR) for Selected Cancer Sites, Males, Canada, 1974-2003

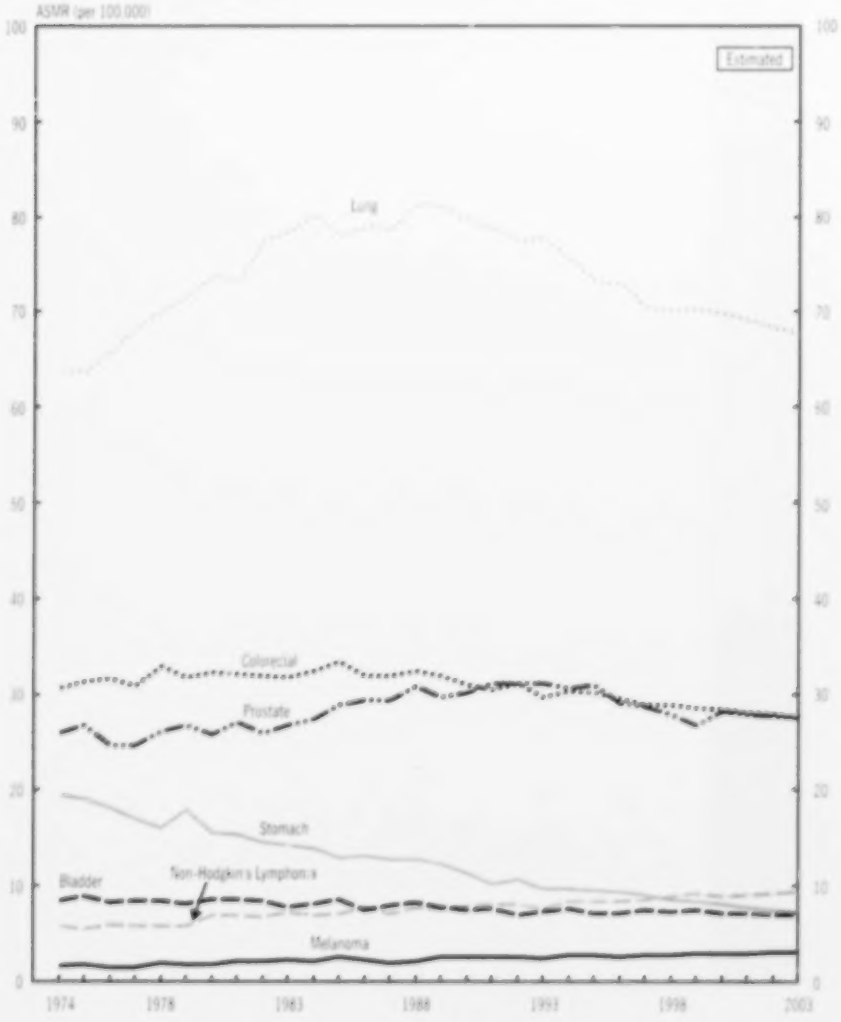


Note: Rates are standardized to the age distribution of the 1991 Canadian population. See Table 7.1 for data points.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 3.2

Age-Standardized Mortality Rates (ASMR) for Selected Cancer Sites, Males, Canada, 1974-2003

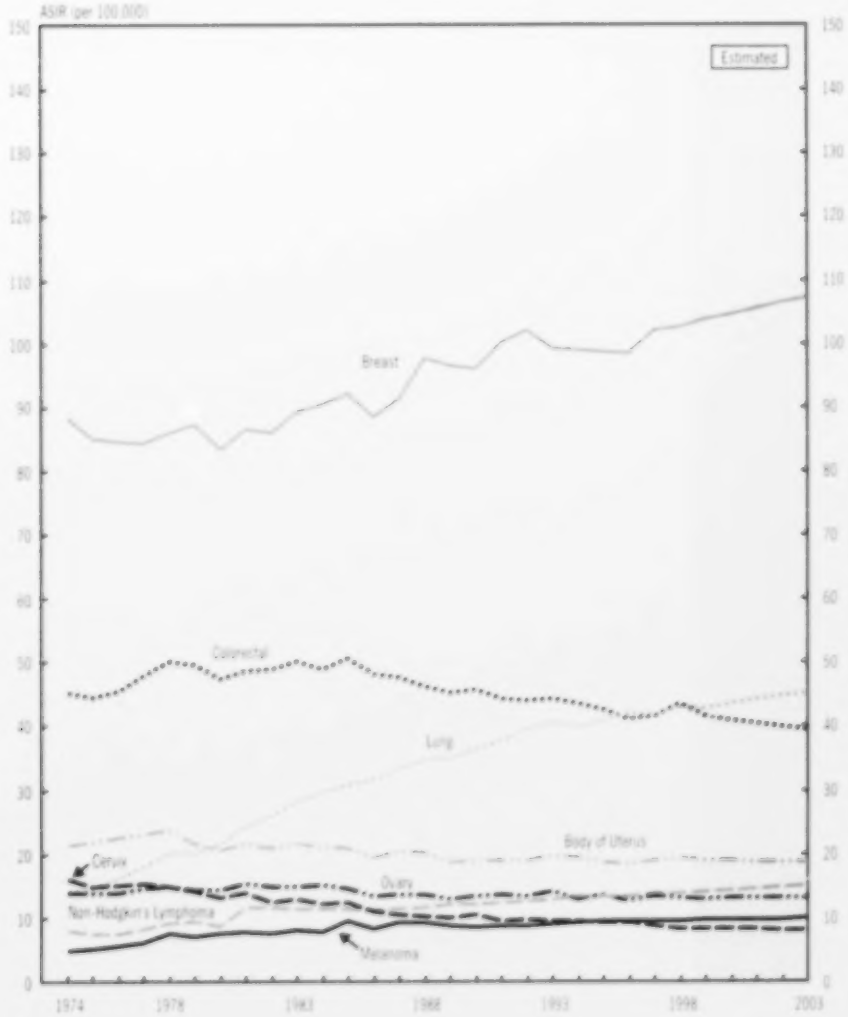


Note: Rates are standardized to the age distribution of the 1991 Canadian population. See Table 7.2 for data points.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 4.1

Age-Standardized Incidence Rates (ASIR) for Selected Cancer Sites, Females, Canada, 1974-2003

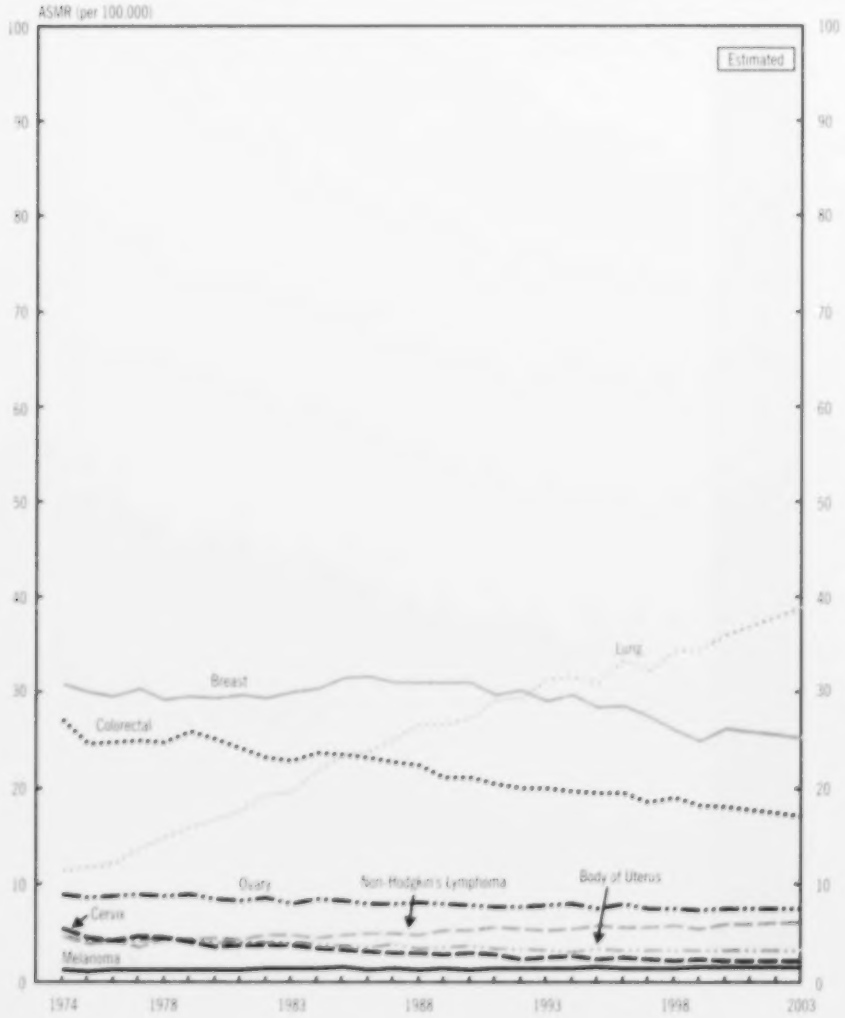


Note: Rates are standardized to the age distribution of the 1991 Canadian population. See Table 8.1 for data points.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 4.2

Age-Standardized Mortality Rates (ASMR) for Selected Cancer Sites, Females, Canada, 1974-2003



Note: Rates are standardized to the age distribution of the 1991 Canadian population. See Table 8.2 for data points.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Table 7.1

Age-Standardized Incidence Rates for Selected Cancer Sites, Males, Canada, 1974-2003

Year	Rate per 100,000							
	All Cancers	Prostate	Lung	Colorectal	Bladder	Non-Hodgkin's Lymphoma	Melanoma	Stomach
1974	359.8	60.0	69.0	51.6	26.4	10.1	4.5	21.1
1975	357.7	61.7	73.1	52.0	24.8	9.7	4.7	21.0
1976	371.9	62.1	75.7	55.9	25.1	10.1	5.1	21.2
1977	391.4	67.9	78.6	57.0	28.0	10.5	5.5	20.1
1978	417.2	74.0	85.1	59.9	30.6	12.5	6.4	20.9
1979	409.8	72.0	83.9	59.2	30.6	12.4	6.8	20.8
1980	406.2	71.4	83.2	57.9	29.2	11.6	7.0	19.0
1981	442.2	78.5	91.2	62.6	32.5	14.7	7.0	20.5
1982	440.7	77.8	92.6	62.7	30.3	15.6	7.5	18.7
1983	448.4	79.6	95.2	63.9	30.9	14.9	7.6	20.4
1984	450.1	80.9	97.1	64.7	31.7	14.9	7.5	18.4
1985	449.8	85.1	93.2	66.2	30.2	15.7	8.7	18.0
1986	451.9	86.1	96.4	64.7	30.6	16.0	9.0	18.0
1987	456.3	89.6	95.0	64.7	30.8	16.6	9.6	17.4
1988	458.5	90.4	95.5	64.6	30.3	17.0	10.4	17.0
1989	451.5	91.9	93.6	63.0	27.9	16.7	9.3	16.8
1990	457.6	99.8	92.7	63.0	27.2	17.7	10.1	15.8
1991	469.0	112.3	90.7	62.9	27.5	17.4	9.1	15.6
1992	480.1	125.3	90.3	64.0	26.8	17.9	10.5	14.6
1993	494.0	140.4	91.9	61.9	27.0	18.8	10.4	14.3
1994	479.3	129.4	87.3	63.0	26.3	18.8	10.8	14.1
1995	455.4	111.1	84.8	61.4	25.7	19.0	11.3	13.3
1996	446.4	109.6	82.2	60.5	24.1	19.1	11.1	13.6
1997	450.7	115.1	79.5	60.2	25.4	19.1	11.4	13.1
1998	445.8	113.7	79.3	61.8	23.5	19.3	11.1	12.6
1999*	451.2	118.9	79.5	61.0	22.0	19.9	11.8	12.3
2000*	446.6	116.9	78.3	60.4	23.7	20.1	11.7	11.9
2001*	444.0	117.0	77.1	60.2	23.4	20.4	11.9	11.6
2002*	441.6	117.2	76.0	59.9	23.2	20.7	12.1	11.3
2003*	439.2	117.4	74.9	59.7	22.9	21.0	12.3	11.0

* Estimated rates

Note: Rates exclude non-melanoma skin cancer (ICD-9 173) and are standardized to the age distribution of the 1991 Canadian population.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Table 7.2

Age-Standardized Mortality Rates for Selected Cancer Sites, Males, Canada, 1974-2003

Year	Rate per 100,000							
	All Cancers	Lung	Colorectal	Prostate	Non-Hodgkin's Lymphoma	Stomach	Bladder	Melanoma
1974	229.2	63.9	30.6	25.9	5.9	19.4	8.5	1.6
1975	230.4	63.7	31.3	26.8	5.6	19.1	8.8	1.7
1976	230.2	65.8	31.7	24.7	6.0	18.2	8.3	1.5
1977	233.5	68.5	30.7	24.6	5.9	17.0	8.4	1.5
1978	236.4	70.1	32.9	26.1	5.9	16.1	8.4	1.9
1979	239.4	71.7	31.8	26.7	5.9	18.0	8.1	1.7
1980	240.7	74.0	32.3	25.8	7.0	15.5	8.6	1.7
1981	239.2	73.2	32.2	27.1	6.9	15.3	8.6	2.1
1982	243.5	77.4	31.9	26.0	6.8	14.6	8.4	2.1
1983	242.9	78.4	31.8	26.7	7.2	14.3	7.8	2.3
1984	247.9	80.2	32.4	27.4	7.0	13.9	8.1	2.1
1985	249.0	78.0	33.4	28.9	7.1	13.0	8.6	2.6
1986	249.0	79.0	32.0	29.4	7.7	13.1	7.4	2.3
1987	248.2	78.6	32.0	29.4	7.1	12.9	7.9	2.0
1988	254.7	81.3	32.4	30.7	7.8	12.8	8.3	2.2
1989	249.5	81.1	31.9	29.7	7.7	12.3	7.8	2.6
1990	246.5	79.5	30.9	30.1	7.9	11.3	7.5	2.6
1991	247.2	78.8	30.4	31.2	8.1	10.3	7.7	2.6
1992	244.7	77.5	31.1	31.0	8.1	10.7	6.9	2.6
1993	242.7	77.9	29.7	31.0	7.7	9.7	7.4	2.4
1994	241.6	75.5	30.2	30.7	8.4	9.7	7.6	2.7
1995	238.7	73.2	30.1	31.0	8.4	9.6	7.2	2.8
1996	236.2	72.9	29.4	29.0	8.4	9.4	7.2	2.6
1997	231.8	70.5	28.9	28.7	8.7	9.0	7.4	2.8
1998	230.0	70.2	28.9	27.9	8.9	8.6	7.2	2.8
1999	228.7	70.3	28.5	26.7	9.2	8.4	7.5	2.9
2000*	228.6	69.8	28.3	28.1	9.0	8.0	7.1	2.9
2001*	227.0	69.1	28.1	27.9	9.1	7.8	7.1	3.0
2002*	225.3	68.4	27.8	27.7	9.2	7.5	7.0	3.0
2003*	223.7	67.8	27.6	27.5	9.4	7.3	7.0	3.1

* Estimated rates

Note: Rates are standardized to the age distribution of the 1991 Canadian population.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Table 8.1

Age-Standardized Incidence Rates for Selected Cancer Sites, Females, Canada, 1974-2003

Year	Rate per 100,000									
	All Cancers	Breast	Lung	Colorectal	Body of Uterus	Non-Hodgkin's Lymphoma	Ovary	Melanoma	Cervix	Stomach
1974	294.9	88.3	14.0	45.2	21.5	8.1	13.8	5.0	16.1	9.9
1975	290.2	85.1	14.7	44.5	21.8	7.5	13.7	5.1	14.9	10.4
1976	294.9	84.6	16.3	45.4	22.7	7.5	13.9	5.6	15.2	9.3
1977	306.0	84.4	17.9	48.0	23.0	8.3	14.5	6.1	15.4	9.3
1978	319.4	86.1	20.1	50.2	23.9	9.2	14.9	7.6	14.7	9.5
1979	313.8	87.3	20.3	49.7	21.7	9.6	14.5	7.1	14.2	9.2
1980	305.5	83.3	21.7	47.4	20.8	8.8	14.4	7.5	13.0	8.6
1981	328.1	86.5	24.3	48.6	21.6	11.6	15.4	7.8	13.9	9.8
1982	321.0	86.0	25.9	48.9	21.0	11.7	14.7	7.5	12.3	8.7
1983	332.8	89.3	28.3	50.2	21.6	11.5	14.9	8.0	12.9	8.7
1984	329.5	90.4	29.6	48.9	21.2	11.3	15.0	7.7	12.2	8.1
1985	335.6	92.2	30.9	50.6	20.8	11.4	14.6	9.5	12.3	8.0
1986	324.9	88.6	31.6	48.2	19.5	11.3	13.3	8.3	10.9	8.3
1987	330.7	91.1	33.2	47.6	20.5	11.5	13.7	9.3	10.4	8.0
1988	336.0	97.8	34.8	46.1	20.1	11.7	13.6	9.2	10.2	7.2
1989	330.0	96.4	35.0	45.3	18.7	12.2	13.0	8.6	10.0	7.2
1990	333.2	96.0	36.5	45.6	19.0	12.1	13.4	8.5	10.4	6.9
1991	337.1	100.1	37.7	44.1	18.9	12.4	13.6	8.8	9.6	6.4
1992	340.9	102.0	39.6	44.0	18.9	12.7	13.5	8.7	9.6	6.5
1993	340.9	99.2	40.6	44.2	19.7	12.9	14.1	9.0	9.5	6.3
1994	339.0	98.9	39.8	43.6	19.4	13.5	12.9	9.2	9.4	6.3
1995	337.2	98.7	40.8	42.4	18.6	13.3	13.6	9.4	9.3	6.0
1996	335.3	98.5	42.0	41.0	18.5	13.3	12.5	9.5	9.2	5.9
1997	340.4	102.0	41.9	41.6	18.9	13.8	13.3	9.5	8.7	5.6
1998	345.4	102.6	42.9	43.6	19.5	13.9	13.2	9.5	8.2	5.6
1999*	342.9	103.8	42.8	41.5	19.1	14.1	12.9	9.6	8.3	5.3
2000*	344.6	104.6	43.6	40.8	18.9	14.3	13.2	9.7	8.3	5.1
2001*	345.7	105.5	44.2	40.3	18.8	14.5	13.2	9.7	8.2	5.0
2002*	346.8	106.4	44.7	39.9	18.8	14.7	13.1	9.8	8.0	4.8
2003*	347.9	107.3	45.3	39.5	18.7	15.0	13.1	9.9	7.9	4.7

* Estimated rates

Note: Rates exclude non-melanoma skin cancer (ICD-9 173) and are standardized to the age distribution of the 1991 Canadian population.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Table 8.2

Age-Standardized Mortality Rates for Selected Cancer Sites, Females, Canada, 1974-2003

Year	Rate per 100,000									
	All Cancers	Lung	Breast	Colorectal	Ovary	Non-Hodgkin's Lymphoma	Stomach	Body of Uterus	Cervix	Melanoma
1974	152.5	11.7	31.1	27.5	9.1	4.8	9.0	4.7	5.6	1.3
1975	147.3	12.1	30.3	24.9	8.9	4.0	8.8	4.3	4.7	1.2
1976	146.0	12.4	29.9	25.0	9.1	4.4	8.5	4.4	4.4	1.3
1977	147.1	13.9	30.6	25.2	9.1	3.8	7.4	4.4	4.8	1.3
1978	147.6	15.0	29.5	25.1	9.0	4.5	7.4	4.6	4.7	1.3
1979	150.2	16.3	29.8	26.1	9.1	4.4	7.2	4.3	4.2	1.2
1980	148.5	17.1	29.7	25.3	8.6	4.6	6.8	4.2	3.7	1.2
1981	149.0	17.9	30.1	24.4	8.5	4.5	7.5	4.1	3.9	1.3
1982	149.3	19.6	29.7	23.5	8.8	4.9	6.7	4.1	3.9	1.5
1983	149.4	19.9	30.4	23.1	8.2	4.9	6.5	4.2	3.9	1.5
1984	151.9	22.2	30.7	23.8	8.7	4.7	5.7	4.0	3.5	1.5
1985	154.8	23.8	31.8	23.7	8.5	5.0	6.0	3.8	3.3	1.6
1986	154.4	24.0	32.0	23.5	8.2	5.1	6.1	3.6	3.2	1.3
1987	154.0	25.3	31.3	23.0	8.2	5.2	5.7	4.1	3.0	1.5
1988	155.3	26.9	31.4	22.7	8.4	5.0	5.1	3.6	3.0	1.3
1989	153.1	27.0	31.2	21.3	8.1	5.5	5.5	3.7	2.9	1.4
1990	153.0	27.6	31.3	21.3	8.1	5.5	5.0	3.9	3.0	1.2
1991	153.5	29.5	30.1	20.7	7.8	5.7	4.9	3.5	2.8	1.4
1992	153.1	29.6	30.4	20.2	7.8	5.5	4.9	3.5	2.4	1.5
1993	154.8	31.7	29.4	20.3	8.0	5.5	4.5	3.4	2.6	1.5
1994	155.0	31.9	30.0	19.9	8.1	5.7	4.5	3.2	2.7	1.5
1995	151.9	31.3	28.7	19.8	7.7	5.9	4.6	3.6	2.4	1.6
1996	155.1	33.6	28.9	19.7	8.2	5.8	4.4	3.4	2.6	1.5
1997	150.2	32.6	27.7	18.8	7.7	5.8	3.9	3.4	2.5	1.5
1998	151.0	34.5	26.4	19.2	7.7	6.0	3.8	3.4	2.3	1.5
1999	149.4	34.8	25.2	18.5	7.5	5.7	4.0	3.3	2.4	1.5
2000*	151.2	36.3	26.5	18.2	7.7	6.1	3.7	3.4	2.3	1.6
2001*	151.0	37.2	26.1	17.9	7.7	6.1	3.6	3.3	2.3	1.6
2002*	150.8	38.2	25.8	17.7	7.7	6.2	3.5	3.3	2.2	1.6
2003*	150.5	39.2	25.4	17.4	7.6	6.3	3.4	3.3	2.2	1.6

* Estimated rates

Note: Rates are standardized to the age distribution of the 1991 Canadian population.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Table 9

Average Annual Percent Change (AAPC) in Age-Standardized Incidence (1991-1998) and Mortality (1991-1999) Rates for Selected Cancer Sites, Canada

	AAPC in Incidence 1991-1998		AAPC in Mortality 1991-1999	
	Males	Females	Males	Females
All Cancers	**-1.2***	**0.1**	**-1.0****	**-0.3***
Thyroid	2.8*	3.9**	0.0	1.1
Melanoma	2.4*	1.4**	1.6*	0.5
Non-Hodgkin's Lymphoma	1.3**	1.5**	1.7**	0.6
Testis	1.2	–	-0.2	–
Multiple Myeloma	1.4	0.4	-0.1	-0.3
Breast	–	0.2	–	-2.1**
Body of Uterus	–	0.0	–	-0.4
Brain	-0.4	0.2	0.4	-0.1
Lung	-2.3**	1.6**	-1.6**	2.1**
Kidney	-0.3	-0.5	0.1	-0.4
Ovary	–	-0.6	–	-0.5
Colorectal	-0.6*	-0.8	-0.9**	-1.2**
Hodgkin's Disease	-1.4*	-0.2	-4.6**	-5.8*
Leukemia	-0.9**	-0.8*	-0.7	-1.2
Pancreas	-1.6**	-0.1	-1.0*	-0.3
Prostate	-1.5	–	-1.9**	–
Bladder	-2.1**	-1.5*	0.0	-0.2
Cervix	–	-2.0**	–	-1.7*
Oral	-3.6**	-1.2	-2.8**	-0.5
Stomach	-2.6**	-2.3**	-2.7**	-3.1**
Larynx	-3.5**	-2.3	-3.3**	-2.8

– Not applicable

* Significant at p = 0.05

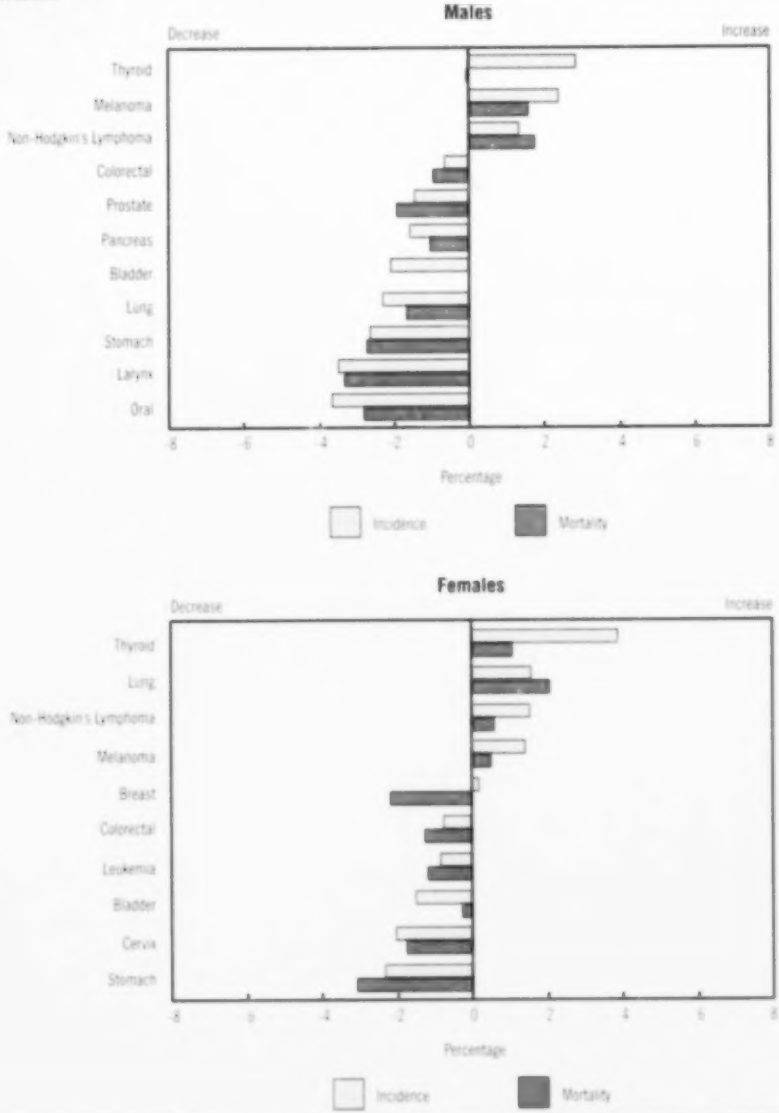
** Significant at p = 0.01

Note: Average Annual Percent Change is calculated assuming a log linear model; incidence rates exclude non-melanoma skin cancer (ICD-9 173). Sites are ranked in decreasing order of combined annual percent change for incidence.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 5

Average Annual Percent Change (AAPC) in Age-Standardized Incidence (1991-1998) and Mortality (1991-1999) Rates for Selected Cancer Sites, Canada

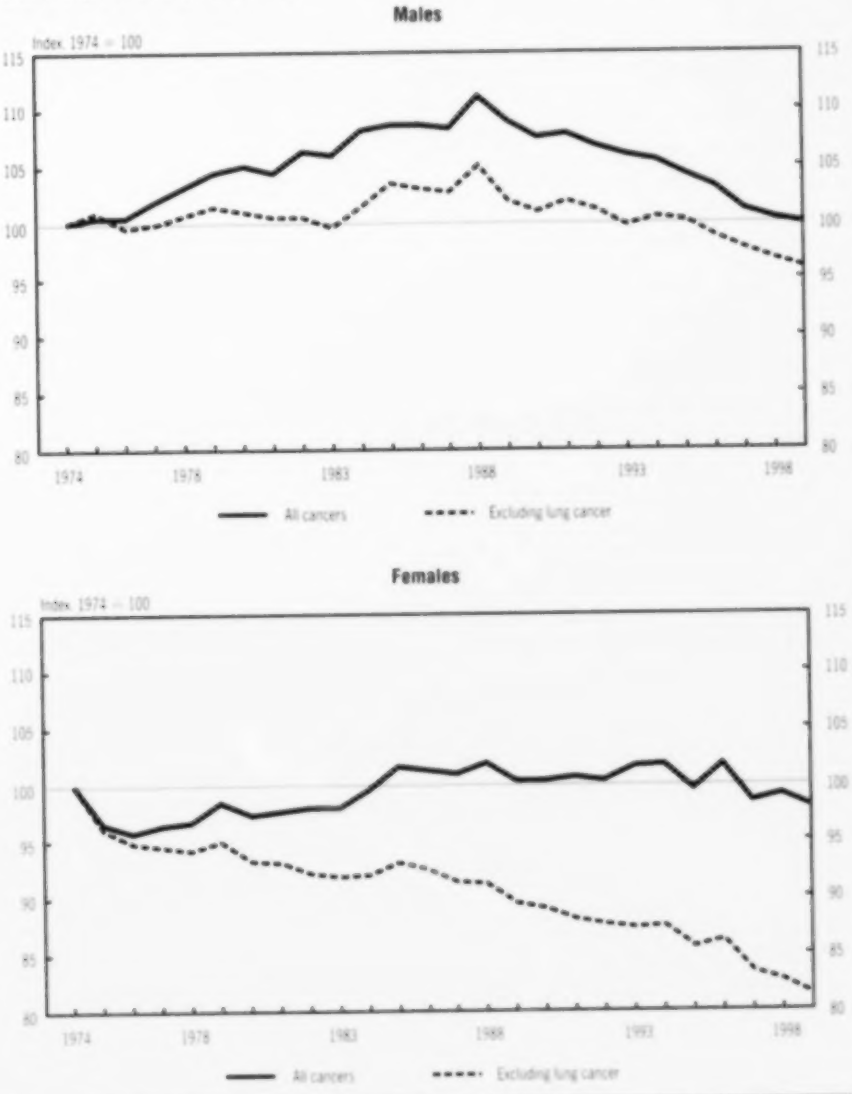


Note: See Table 9 for percent change for all sites. Sites are ranked in decreasing order of combined percent change of incidence.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 6

Index of Age-Standardized Mortality Rates Including and Excluding Lung Cancer, Canada, 1974-1999



Note: Rates are standardized to the age distribution of the 1991 Canadian population. See also the *Glossary* and *Appendix II: Methods*.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

AGE AND GENDER DISTRIBUTION OF CANCER

This section shows estimates for 2003 by 10-year age groups for all sites combined (Table 10) and for the four leading types of cancer (Table 11). Cancer is primarily a disease of the elderly. The estimates for 2003 shown in Table 10 indicate that 62,200 new cases (44%) and 39,700 cancer deaths (59%) occur in Canadians aged 70 years or more, while an additional 33,900 new cases (24%) and 14,300 deaths (21%) occur in those aged 60-69. In contrast, just 1% of new cases and only 0.3% of deaths occur prior to age 20. Estimates of the distribution by leading site for people aged 20 or more are presented in Table 11 and show that about 50% of all newly diagnosed cancers of the lung, prostate, colon and rectum occur among Canadians aged 70 or more. For example, for prostate cancer, 53% of cases and 86% of deaths occur in men over 70. In the case of breast cancer, 22% of cases occur in women under age 50, 48% occur in women aged 50 to 69, and 31% in women aged 70 and over.

Trends in age-standardized rates of incidence and mortality since 1971 for all cancers are plotted for four specific age groups in Figure 7 (in which each age group has a different scale for the y axis because of the wide range in age-specific rates). Since 1981, absolute increases in cancer incidence rates have occurred primarily in Canadians aged 50 or over. The gender differences seen in incidence after age 50 are almost certainly due to changes in prostate cancer, which began with rapid increases in the early 1990s.

Most encouraging is the fairly steady decline in mortality that has occurred since 1988 among both men and women in all age groups under 70 years. Mortality rates have generally declined substantially since 1970 among Canadians aged 0-19 with more moderate declines in the 20-49 age group. Among men and women 50-69 years old, decreases in mortality rates have occurred primarily since the late 1980s.

Age-specific rates of cancer incidence and mortality by 5-year age groups are plotted using actual data for cancer incidence in 1998 and mortality in 1999, the most recent years for which complete data are available (Figure 8). Cancer incidence and mortality increase substantially with age in both genders, 19 times as many new cases occurring in those over age 80 as in those under age 20. Although incidence rates were somewhat higher among women than men between 20 and 54 years of age, for all other age groups incidence was higher among men. This is because of the higher incidence of cancers of the breast and genital organs in women of reproductive age, and the higher incidence of most types of cancer in older men. Mortality rates were higher among men than women for all age groups with the exception of those aged 35-54.

Cancer is primarily a disease of older Canadians.
Mortality rate declines are most
noted in younger age groups.

Table 10

Distribution by Age Group and Gender, Canada, 2003

Age Group	Population (000s) 2003 Estimates			New Cases 2003 Estimates			Deaths 2003 Estimates		
	Total	M	F	Total	M	F	Total	M	F
0-19	7,802	3,997	3,805	1,250	670	580	210	110	100
20-29	4,254	2,158	2,096	1,650	760	900	250	130	120
30-39	4,792	2,416	2,377	4,500	1,650	2,800	860	360	500
40-49	5,260	2,636	2,625	12,200	4,100	8,100	3,400	1,500	1,950
50-59	4,010	1,991	2,019	24,300	11,000	13,300	8,600	4,300	4,300
60-69	2,536	1,230	1,306	33,900	19,400	14,500	14,300	8,200	6,100
70-79	1,855	827	1,028	38,400	22,200	16,200	20,800	11,900	8,900
80+	1,038	359	680	23,800	11,500	12,200	18,900	9,300	9,600
All Ages	**31,549**	**15,614**	**15,934**	**139,900**	**71,300**	**68,600**	**67,400**	**35,800**	**31,600**

Note: Incidence figures exclude non-melanoma skin cancer (ICD-9 173). Total of rounded numbers may not equal rounded total number. Please refer to *Appendix II: Methods* for further details. The 2003 population projections were provided by the Census and Demographics Branch, Statistics Canada.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Table 11

Distribution by Selected Cancer Site, Age Group and Gender, Canada, 2003

Age Group	Lung			Colorectal			Prostate	Breast
	Total	M	F	Total	M	F	M	F
New Cases								
20-29	20	15	10	30	15	15	–	70
30-39	190	90	100	220	120	100	5	930
40-49	1,050	450	580	1,050	560	490	220	3,700
50-59	3,400	1,750	1,650	2,700	1,600	1,150	2,400	5,500
60-69	6,000	3,600	2,400	4,200	2,600	1,650	6,200	4,600
70-79	7,000	4,300	2,700	5,600	3,100	2,500	6,700	4,000
80+	3,400	1,950	1,500	4,200	1,750	2,400	3,200	2,500
Ages 20+	**21,100**	**12,200**	**9,000**	**18,000**	**9,800**	**8,300**	**18,800**	**21,100**
Deaths								
20-29	5	–	5	15	5	5	–	10
30-39	100	40	60	65	30	30	–	130
40-49	780	340	430	310	170	140	10	560
50-59	2,500	1,400	1,150	920	540	380	130	970
60-69	4,900	3,000	1,950	1,650	1,050	620	530	940
70-79	6,600	4,000	2,600	2,500	1,450	1,050	1,500	1,250
80+	3,900	2,200	1,700	2,800	1,200	1,600	2,100	1,450
Ages 20+	**18,800**	**10,900**	**7,900**	**8,300**	**4,400**	**3,800**	**4,200**	**5,300**

– Fewer than 3 cases or deaths.

Note: Figures exclude non-melanoma skin cancer (ICD-9 173). Total of rounded numbers may not equal rounded total number. Please refer to *Appendix II: Methods* for further details.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 7

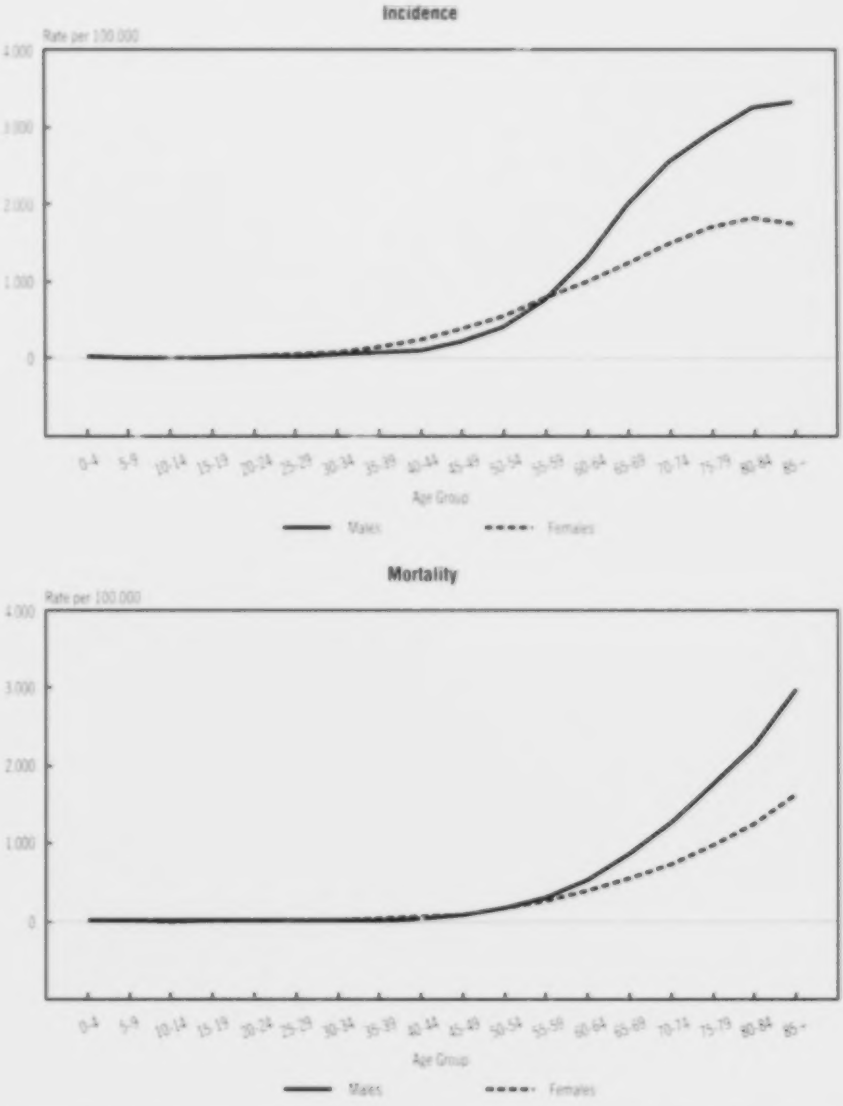
Age-Standardized Incidence and Mortality Rates by Broad Age Group, All Cancers, Canada, 1971-2003

Note: The range of rate scales differs widely among the four age groups. Incidence figures exclude non-melanoma skin cancer (ICD-9 173).

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 8

Age-Specific Incidence (1998) and Mortality (1999) Rates for All Cancers by Gender, Canada



Note: Incidence rates exclude non-melanoma skin cancer (ICD-9 173).
Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

PROBABILITY OF DEVELOPING/DYING FROM CANCER

Table 12 presents the probability (expressed as a percentage) of Canadians developing the more common cancers within specific decades of age, as well as the lifetime probability of developing, or dying from, one of these cancers.

The calculation of these probabilities models the occurrence of cancer in a hypothetical cohort. For example, if a cohort of 1,000 men of age 50 is followed until the end of age 59, 57 of them, or 5.7% (1 in 17.5), will develop some type of cancer within this 10-year period; this percentage therefore describes the risk of a 50-year-old man developing some type of cancer before age 60. Similarly, a 60-year-old woman has a 10.2% (1 in 9.8) chance of developing some type of cancer before age 70. For the lifetime probability of developing cancer, the data are presented both as the probability expressed as a percentage of developing cancer and as the inverse of that probability. For example, men have a lifetime probability of 0.41 (41%) of developing cancer, while the inverse of that probability is 2.4. Thus, approximately 2 of every 5 men are expected to develop cancer of some site during their life. Similarly, 1 in 2.7 women (slightly more than 1 of every 3 women) will develop cancer during their life. One in 3.6 men and 1 in 4.3 women (i.e. more than 1 in 4 and 1 in 5 respectively) will die of cancer.

During their lifetimes, 1 in 8.8 women are expected to develop breast cancer, the most common cancer (excluding non-melanoma skin cancer) to afflict women, and 1 in 27.4 women are expected to die from it. One in 16.3 women will develop colorectal cancer, but only 1 in 30.7 will die from it. One in 18.1 will develop lung cancer, and 1 in 20.1 will die from this disease, making it the most likely cause of cancer death in Canadian women. Over their lifetimes, 1 in 8.3 men will develop prostate cancer, but only 1 in 28.1 will die from it. One in 11.4 men will develop lung cancer, and 1 in 12.0 will die from this condition. Lung cancer is thus by far the leading cause of cancer deaths in Canadian men.

The probability of developing cancer within the next 10 years gives a useful indication of the short-term risk of cancer. Although the lifetime risk of developing breast cancer is 11.4% (1 in 8.8), and although the risk increases with age, the chance of a 60-year-old woman developing breast cancer before age 70 is only 3.1% (1 in 33.3); this figure may be more meaningful than the lifetime probability statistic for a 60-year-old woman contemplating her risk of breast cancer. Table 12 shows how steeply the risk of developing prostate cancer rises with age. A man has very little probability of developing prostate cancer by age 50. However, a 70-year-old man has a 6.1% (1 in 16.4) chance of developing prostate cancer by age 80; this percentage represents the highest risk for either men or women of developing a specific cancer in any decade of life.

The decrease in the probability of very old people (80-89) developing, or dying from, many cancers, in contrast to the general increasing risk with increasing age, is due to the increase in the probability of death from other causes at an advanced age.

One in 4.3 women and 1 in 3.6 men will die of cancer.

Table 12

Probability of Developing Cancer by Age, and Lifetime Probability of Developing and Dying from Cancer, Canada

	Probability (%) of Developing Cancer in Next 10 Years by Age Group						Lifetime Probability (%) of Developing		Dying	
	30-39	40-49	50-59	60-69	70-79	80-89	%	One in:	%	One in:
Male										
All Cancers	**0.6**	**1.6**	**5.7**	**14.4**	**20.9**	**19.6**	**41.2**	**2.4**	**27.4**	**3.6**
Prostate	–	0.1	1.2	4.6	6.1	5.5	12.0	8.3	3.6	28.1
Lung	–	0.2	1.0	2.9	4.5	3.5	8.8	11.4	8.3	12.0
Colorectal	0.1	0.2	0.8	2.0	3.2	3.1	6.7	15.0	3.5	28.9
Lymphoma	0.1	0.2	0.4	0.7	1.1	1.1	2.9	34.8	1.6	62.9
Bladder	–	0.1	0.2	0.7	1.3	1.5	2.7	37.7	1.0	103.1
Kidney	–	0.1	0.3	0.5	0.6	0.6	1.6	63.7	0.7	144.9
Stomach	–	–	0.2	0.4	0.6	0.8	1.4	70.4	1.0	99.0
Oral	–	0.1	0.3	0.4	0.5	0.5	1.4	71.9	0.5	185.2
Leukemia	–	0.1	0.2	0.3	0.6	0.6	1.4	71.4	1.0	103.1
Pancreas	–	–	0.1	0.3	0.5	0.6	1.2	86.2	1.3	79.4
Melanoma	0.1	0.1	0.2	0.3	0.4	0.4	1.1	90.9	0.3	312.5
Female										
All Cancers	**1.1**	**3.0**	**6.4**	**10.2**	**13.6**	**12.8**	**37.6**	**2.7**	**23.1**	**4.3**
Breast	0.4	1.3	2.5	3.1	3.3	2.6	11.4	8.8	3.7	27.4
Colorectal	0.1	0.2	0.7	1.3	2.4	2.7	6.1	16.3	3.3	30.7
Lung	–	0.2	0.8	1.7	2.2	1.4	5.5	18.1	5.0	20.1
Lymphoma	0.1	0.1	0.3	0.6	0.8	0.9	2.5	39.8	1.4	69.9
Body of Uterus	–	0.1	0.5	0.8	0.8	0.5	2.3	43.5	0.6	178.6
Ovary	0.1	0.1	0.3	0.4	0.5	0.4	1.6	64.5	1.1	92.6
Pancreas	–	–	0.1	0.3	0.5	0.6	1.3	80.0	1.3	76.9
Leukemia	–	–	0.1	0.2	0.4	0.4	1.1	92.6	0.7	135.1
Melanoma	0.1	0.1	0.2	0.2	0.3	0.2	1.0	103.1	0.2	476.2
Kidney	–	0.1	0.1	0.2	0.3	0.3	1.0	103.1	0.4	243.9
Bladder	–	–	0.1	0.2	0.3	0.4	1.0	102.0	0.4	243.9
Stomach	–	–	0.1	0.2	0.3	0.4	0.8	119.0	0.7	151.5
Cervix	0.1	0.2	0.1	0.1	0.1	0.1	0.7	137.0	0.3	344.8
Oral	–	–	0.1	0.2	0.2	0.2	0.6	156.3	0.3	400.0

– Value less than 0.05

Note: The probability of developing cancer is calculated according to age- and gender-specific cancer incidence and mortality rates for Canada in 1998 and life tables based on 1997-1999 all cause mortality rates. The probability of dying from cancer represents the proportion of persons dying from cancer in a cohort subjected to the mortality conditions prevailing in the population at large in 1999. See *Appendix II: Methods* for details.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

POTENTIAL YEARS OF LIFE LOST DUE TO CANCER

Figure 9 shows the rank order of 12 causes of premature death in Canada in 1999 as represented by potential years of life lost (PYLL). This illustrates that cancer was the leading cause of PYLL for men and women: 932,000 potential years were lost as a result of cancer (Table 13), representing 31% of the PYLL resulting from all causes of death. Diseases of the heart were the second leading cause. Among children and youth aged 0-19, cancer ranked as the sixth leading cause of PYLL after perinatal causes, congenital anomalies, motor vehicle accidents, other accidents and suicide. The total PYLL due to cancer deaths among Canadian children and youth (ages 0-19) in 1999 was 15,000 years.

The PYLL due to specific types of cancer (Table 13) show that lung cancer was responsible for 252,000 PYLL, representing 27% of the premature mortality caused by cancer. For men in 1999, the three leading cancers were lung, colorectal and prostate, accounting for 50% of the PYLL due to cancer. The three leading cancers for women were lung, breast and colorectal, accounting for 53% of PYLL due to cancer. The ranking by relative importance of these cancers for men and women with respect to PYLL has been consistent in recent years. For women, however, the potential years of life lost due to lung cancer, which are greater than for breast cancer, reflect the high rates of lung cancer mortality among women aged 50-79. Among men, although prostate cancer is more common than lung cancer, the PYLL due to lung cancer are four times higher than for prostate cancer, reflecting higher mortality rates for lung cancer and the younger age at which men develop and die from this disease.

The premature mortality is higher for cancers that are more common, have an earlier age of onset, and more quickly lead to death. With regard to the most common cancers in women and men, the PYLL from breast cancer (91,000) far exceed the PYLL for prostate cancer (32,000), reflecting the relatively young age at which women die from breast cancer. In contrast, the PYLL for Hodgkin's disease, at 4,000, reflect a cancer that is less common and relatively curable.

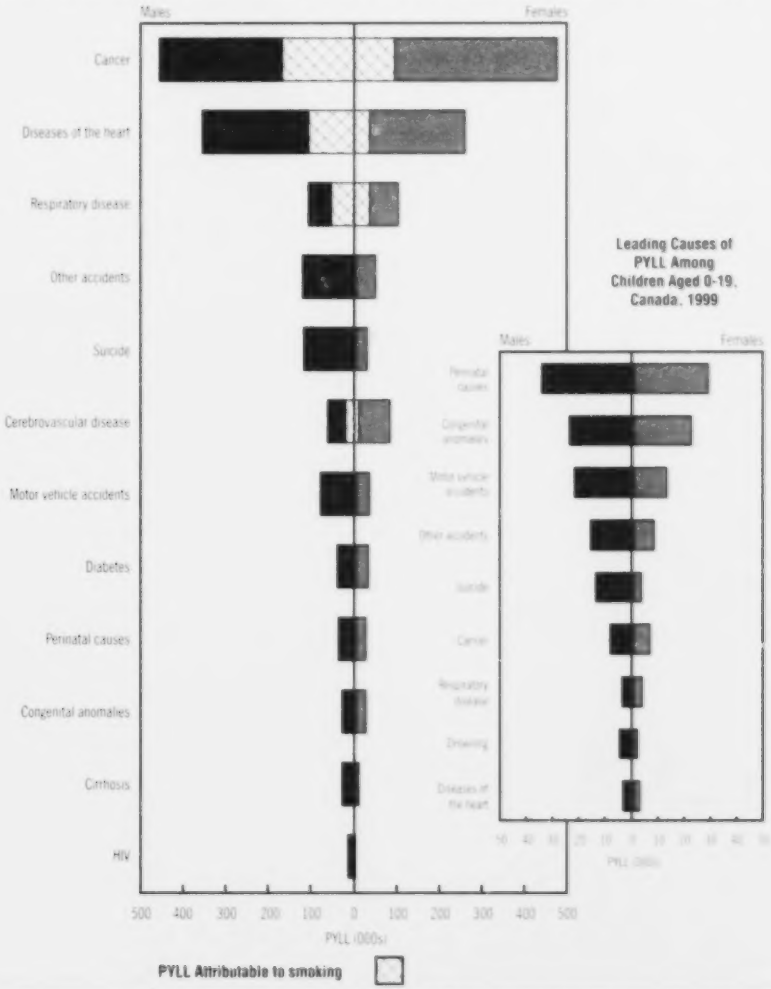
Although the number of men who die from cancer each year exceeds the number of women, the PYLL for women (478,000) are slightly higher than the PYLL for men (455,000). This is because women generally live longer than men, and some of the deaths due to female cancers occur at younger ages.

The use of tobacco products is the single most important cause of preventable, premature cancer deaths. Many deaths from other diseases also occur because of smoking (Figure 9). Among men, smoking is responsible for almost one-third of PYLL due to all cancers, almost one-quarter of PYLL due to diseases of the heart, and about one-half of PYLL due to respiratory disease. Among women, smoking is responsible for about one-fifth of PYLL due to all cancers.

Cancer is the leading cause of premature death in Canada.

Figure 9

Selected Causes of Potential Years of Life Lost (PYLL), Canada, 1999



Note: Figures are ranked in order of total PYLL for both genders combined and are calculated on the basis of life expectancy. Count and percentage totals may not add because of rounding and the exclusion of other sites. Childhood cancers are also included within the relevant sites. Smoking attributable PYLL are based on relative risk estimates from follow up of CPS-II cohort and 1996 Canadian smoking prevalence estimates. See *Appendix II: Methods* for details.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Table 13

Potential Years of Life Lost Due to Cancer, Canada, 1999

	Potential Years of Life Lost (PYLL)					
	Total		Males		Females	
	Years	%	Years	%	Years	%
ALL CAUSES	3,054,000	–	1,651,000	–	1,403,000	–
All Cancers	932,000	100	455,000	100	478,000	100
Childhood Cancer (Ages 0-19)	15,000	1.6	8,200	1.8	7,100	1.5
Cancer Site						
Lung	252,000	27.1	141,000	31.0	112,000	23.3
Colorectal	105,000	11.3	54,000	11.8	52,000	10.8
Breast	91,000	9.8	–	–	91,000	19.1
Pancreas	43,000	4.6	21,000	4.7	22,000	4.5
Non-Hodgkin's Lymphoma	40,000	4.3	23,000	5.0	17,000	3.6
Leukemia	36,000	3.8	20,000	4.3	16,000	3.4
Brain	35,000	3.8	19,000	4.3	16,000	3.4
Prostate	32,000	3.5	32,000	7.1	–	–
Stomach	28,000	3.0	16,000	3.6	12,000	2.5
Ovary	25,000	2.7	–	–	25,000	5.3
Kidney	20,000	2.1	12,000	2.6	8,000	1.7
Oral	16,000	1.8	11,000	2.5	5,000	1.1
Bladder	16,000	1.8	11,000	2.5	5,000	1.1
Multiple Myeloma	15,000	1.6	7,000	1.6	8,000	1.6
Melanoma	14,000	1.5	8,000	1.8	6,000	1.2
Cervix	10,000	1.1	–	–	10,000	2.2
Body of Uterus	10,000	1.0	–	–	10,000	2.0
Larynx	7,000	0.8	5,000	1.2	2,000	0.3
Hodgkin's Disease	4,000	0.4	2,000	0.5	2,000	0.3
Testis	1,000	0.1	1,000	0.3	–	–

– Not applicable

Note: Figures are ranked in order of total PYLL for both sexes combined and are calculated on the basis of life expectancy. Count and percentage totals may not add because of rounding and the exclusion of other sites. Childhood cancers are also included within the relevant sites.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Prevalence rates and counts refer to the total number of people who are living with a diagnosis of cancer at a certain point in time. Table 14 reports estimates for the number of Canadians who were alive in 1998 within 15 years of their cancer being diagnosed. They are reported for the four most common cancers, other cancers combined and all cancers. The Table shows counts, the percentage of the population and its reciprocal (i.e. the population that gives rise to one prevalent case), who were living with a cancer diagnosed in the 15 years preceding 1999. These estimates are based on survival rates from Saskatchewan, which were applied to the Canadian incidence data.

The overall prevalence of cancer in the Canadian population is 2.1% among men and 2.4% among women, or about 313,100 male cancer survivors and 366,700 female cancer survivors. That means that 1 in 48 Canadian men and 1 in 41 Canadian women have been given a diagnosis of cancer at some time during the previous 15 years.

Among men the most prevalent cancer site is the prostate, at 96,300 prevalent cases or 0.6% of the male population, followed by colorectal (43,800) and lung (17,000) cancers. Breast cancer is the most common site in women (141,300 cases or 0.9% of the female population), which is also followed by colorectal (43,800 cases) and lung (15,300) cancers. Prevalence rates are influenced by incidence rates, age at diagnosis and the average period of survival. Therefore, although incidence rates and survival rates for breast and prostate cancer are quite similar, because breast cancer is more common than prostate cancer in younger age groups, the prevalence of breast cancer is higher than that of prostate cancer. In the case of lung cancer, survival rates are lower; so even though incidence is high, prevalence is relatively low.

Prevalence is a useful indicator of the burden cancer poses both at the personal level and at the level of the health care system. Although many individuals who survive cancer continue to live productive and rewarding lives, the cancer experience is difficult and presents many physical, emotional and spiritual challenges to patients and to their families and loved ones. These challenges often persist beyond the point of physical recovery from the cancer itself, often requiring extensive use of rehabilitation and supportive care resources. Cancer survivors are also at risk of recurrence or of developing a second primary cancer and therefore may place increased demands on health services. This increased demand must be considered in planning for health services.

A large number of Canadians live with the effects of cancer and have continuing need for cancer control resources.

Table 14

Prevalence of the Most Common Cancers, by Gender, Canada, 1998

	Prevalence Count 15 Year		Prevalence Percentage of 1998 Population		Ratio of Cases per Population	
	Males	Females	Males	Females	Males	Females
Colorectal	43,800	43,800	0.3	0.3	1:342	1:342
Lung	17,000	15,300	0.1	0.1	1:879	1:978
Prostate	96,300	–	0.6	–	1:156	–
Breast	–	141,300	–	0.9	–	1:106
Other Cancers	156,000	166,500	1.0	1.1	1:96	1:90
All Cancers	**313,100**	**366,700**	**2.1**	**2.4**	**1:48**	**1:41**

Note: Survival rates are based on Saskatchewan data from 1983 to 1997 with follow-up to 1998.
Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

CANCER IN CHILDREN AND YOUTH AGED 0-19 YEARS

Table 15 shows the number of new cases of cancer with age-standardized incidence rates (1994-1998), and the number of deaths due to cancer with age-standardized mortality rates (1994-1998) for Canadian children and youth aged 0-19. For these periods, cancer was diagnosed in an average of 1,262 children every year, and 239 died each year from their disease. Leukemia accounted for 26% of new cases and 32% of deaths due to cancer in children, and remains the most common of the childhood cancers. Cancers of the brain and spinal cord, the second most common group of childhood cancers, constituted approximately 17% of new cases and 25% of deaths, and lymphomas accounted for 16% of new cases and 8% of deaths.

An indicator of disease prognosis is provided by the ratio of the number of deaths to the number of cases and can be calculated using the data available from Table 15. The deaths to cases ratio for all childhood cancers combined was approximately 0.20. The highest ratios (> 0.27) were found in children with liver (hepatic) cancer, tumours of the sympathetic nervous system (particularly neuroblastoma), tumours of bone, and tumours of the brain and spinal cord. The high ratio for neuroblastoma reflects the advanced stage at which this disease is frequently diagnosed. Soft tissue sarcomas (0.26), particularly rhabdomyosarcoma (0.32), also have a relatively poor prognosis. The ratio for acute non-lymphocytic leukemia (0.36) was much higher than that observed for acute lymphocytic leukemia (0.13), resulting in a relatively high overall ratio for leukemia. Although the lymphomas have a relatively good prognosis overall, Hodgkin's disease (0.03) has a very low death to cases ratio compared with non-Hodgkin's lymphoma (0.20). The low ratios observed for retinoblastoma and germ cell tumours indicate the low fatality associated with these tumours.

The low death rates for acute lymphocytic leukemia, Hodgkin's disease and germ cell tumours reflect the major advances made in treating these cancers over 30 years. Since the early 1950s, mortality rates for childhood cancer have declined by more than 50%, with most of the improvement occurring after 1970. Improved survival has been particularly dramatic for the most common childhood neoplasm, acute lymphocytic leukemia, as well as for lymphomas and kidney cancer. Although essentially no one survived childhood leukemia 40 years ago,[1] currently, approximately 80% of Canadian children and teenagers with acute lymphoblastic leukemia are alive five years after diagnosis.[14] The improvement in childhood cancer survival relative to that of most adults with cancer reflects biological differences in cancer in adults as compared with children, as well as differences in treatment approaches. The success of clinical trials in identifying new agents and treatment modalities has been significant; a much larger proportion of children than adults with cancer participate in therapeutic trials. As well, a shift towards multi-disciplinary care has improved overall outcomes and decreased morbidity.

Since the early 1950s mortality rates for childhood cancer have declined by more than 50%.

Table 15

New Cases and Age-Standardized Incidence Rates (1994-1998), and Deaths and Age-Standardized Mortality Rates (1994-1998), by Histologic Cell Type for Children and Youth Aged 0-19 Years, Canada

Diagnostic Group	New cases (1994-1998)		ASIR per 1,000,000 per year	Deaths (1994-1998)		ASMR per 1,000,000 per year	Deaths/ Cases Ratio
	Number	%		Number	%		
Leukemia	**1,650**	**26.2**	**41.55**	**376**	**31.5**	**9.93**	**0.23**
Acute lymphocytic	1,279	20.3	32.15	163	13.6	4.17	0.13
Acute non-lymphocytic	272	4.3	6.87	99	8.3	2.58	0.36
Brain and Spinal	**1,065**	**16.9**	**26.74**	**301**	**25.2**	**6.83**	**0.28**
Astrocytoma	501	7.9	12.54	79	6.6	2.23	0.16
Primitive neuroectodermal	240	3.8	6.05	72	6.0	1.47	0.30
Ependymoma	92	1.5	2.33	38	3.2	0.72	0.41
Lymphoma	**995**	**15.8**	**24.71**	**97**	**8.1**	**3.51**	**0.10**
Hodgkin's disease	574	9.1	14.21	16	1.3	0.70	0.03
Non-Hodgkin's lymphoma	414	6.6	10.31	81	6.8	2.81	0.20
Carcinoma	**526**	**8.3**	**13.08**	**29**	**2.4**	**1.13**	**0.06**
Thyroid	229	3.6	5.68	1	0.1	0.03	0.00
Melanoma	131	2.1	3.26	9	0.8	0.39	0.07
Germ Cell and Other Gonadal	**402**	**6.4**	**10.09**	**10**	**0.8**	**0.42**	**0.02**
Gonadal germ cell tumours	262	4.2	6.54	1	0.1	0.05	0.00
Soft Tissue	**399**	**6.3**	**10.05**	**105**	**8.8**	**2.96**	**0.26**
Rhabdomyosarcoma	171	2.7	4.30	55	4.6	1.45	0.32
Fibrosarcoma	53	0.8	1.34	6	0.5	0.23	0.11
Bone	**341**	**5.4**	**8.47**	**100**	**8.4**	**3.74**	**0.29**
Osteosarcoma	178	2.8	4.41	55	4.6	2.16	0.31
Ewing's sarcoma	115	1.8	2.80	41	3.4	1.49	0.36
Sympathetic Nervous System	**330**	**5.2**	**8.65**	**90**	**7.5**	**1.26**	**0.27**
Neuroblastoma	318	5.0	8.35	90	7.5	1.26	0.28
Renal Tumours	**302**	**4.8**	**7.72**	**33**	**2.8**	**0.69**	**0.11**
Wilms tumour	278	4.4	7.10	27	2.3	0.45	0.10
Retinoblastoma	**122**	**1.9**	**3.21**	**0**	**0.0**	**0.00**	**0.00**
Hepatic Tumours	**84**	**1.3**	**2.17**	**24**	**2.0**	**0.54**	**0.29**
Other Cancers	**92**	**1.5**	**2.37**	**22**	**1.8**	**0.64**	**0.24**
Total (5 years)	**6,309**	**100.0**	**158.81**	**1,195**	**100.0**	**31.97**	**0.19**
Average Per Year	**1,262**			**239**			

Data are shown for the most recent five-year period available and exclude non-melanoma skin cancer (ICD-9 173) and in-situ carcinomas (ICD-9 230-234). Data are grouped according to the International Classification Scheme for Childhood Cancer, World Health Organization (1996), and ranked by the number of cases. Rates are age-standardized to the 1991 Canadian population and because of disease rarity are expressed **per million per year**.

Only major subcategories within each group are included. Acute lymphocytic includes all lymphoid, and approximately 99% are acute. Non-Hodgkin's lymphomas include Burkitt lymphoma and unspecified lymphomas; the neuroblastoma category includes ganglioneuroblastoma; Wilms tumour includes rhabdoid and clear cell sarcoma; rhabdomyosarcoma includes embryonal sarcoma; and fibrosarcoma includes other fibromatous neoplasms.

Source: Surveillance and Risk Assessment Division and Chronic Disease Control and Management Division, CCDPC, Health Canada, and Health Statistics Division, Statistics Canada

Non-Hodgkin's lymphoma (NHL) encompasses a wide variety of malignancies arising in lymphoid tissue. Depending on the subtype, it may grow slowly or rapidly, and often involves the bone marrow. It may arise in or spread to other organs, including the central nervous system. The two broadest sub-types are diffuse and nodular, also known as follicular lymphomas. Although both children and adults develop NHL, in contrast to adult lymphomas, childhood NHL is almost never follicular and occurs predominantly in the chest and abdomen, and less commonly at peripheral nodal sites.

The number of new cases of NHL is projected to have more than tripled over the last 30 years in both males and females while rates have doubled (Figure 10.1). The number of deaths each year from NHL has almost tripled over the last 30 years (Figure 10.2), whereas mortality rate increases have been more modest. Age-standardized rates have climbed faster among males than females.

Incidence Patterns by Age and Gender

With the exception of children and adolescents (not shown), incidence rates have increased; as with almost all cancers, incidence rates increase with increasing age and are higher among males than females. Among men, the largest increases were seen in men 80 years or older (Figure 10.3 and Table 16). Among women, the largest relative increases were in women aged 30–49 years (Table 16), although it is not apparent in Figure 10.4 because of the low rates at younger ages. The age-specific patterns of NHL mortality rates (Figures 10.5 and 10.6) were similar to those noted for incidence. As is the case for most cancers, NHL mortality rates have declined among children and adolescents. For the period 1991-1998, the average annual percent change in incidence was 1.4%, and the corresponding change in mortality for 1991-1999 was 1.3% (Table 16).

International Comparisons

Age-standardized incidence rates of NHL in Canada and the United States are among the highest in the world (Figures 10.7 and 10.8). Rates are low in east Asia, intermediate in Africa and high in Western Europe, Australia, and Northern America (United States and Canada). International variations reflect differences in reporting completeness as well as true variation related to exposure to risk factors.

Incidence and mortality rates for NHL tended to be higher in the United States than in Canada beginning in the 1990s (Figure 10.9); however, this gap is becoming less evident, perhaps as a result of better control of AIDS, which was a more important cause of NHL in the United States than in Canada in the 1990s.

Incidence Patterns of Non-Hodgkin's Lymphoma by Sub-type

The current classification scheme for NHL is an updated World Health Organization (WHO) version of the Revised European American Lymphoma (REAL) classification. It refers to morphology and cell lineage, and divides NHL according to B-cell or T-cell natural killer-cell origin, and according to whether it is composed of precursor (thymic or lymphoblastic) or peripheral (mature or post-thymic) lymphocytes.[1] The current report relies upon the previous Working Formulation, which used cell morphology as the basis of sub-types of NHL. The greatest difference in sub-type by age was found between those under age 20 and those 20 years and older (Figure 10.10). For example, Burkitt lymphoma is a common form of NHL in children and adolescents but is rarely seen in adults.

Broadly speaking, nodular/follicular forms of NHL tend to have an indolent, but ultimately fatal course. Usually the disease is widespread throughout the body and involves the bone marrow early in the course of the disease. Patients may live 10 years or more, intermittently requiring easily tolerated therapies. The diffuse forms tend to be much more aggressive but hold the possibility of cure, especially when the spread is limited.[1] Most cases of NHL are diffuse, although the increases have been greater for the nodular form (Figures 10.11 and 10.12).

Implications for Non-Hodgkin's Lymphoma Control Efforts

Unlike most major forms of cancer, both incidence and mortality rates of non-Hodgkin's lymphoma are increasing. The reasons for these increasing rates are not known but are likely to involve both true increases and improvements in the detection and classification of NHL. The introduction of immunological and genetic techniques has improved our ability to appropriately identify and categorize the condition; unfortunately, these improvements have complicated the interpretation of temporal trends. Improvements in our understanding of hematopoietic neoplasms have resulted in the recognition that certain leukemias and lymphomas are different manifestations of the same neoplasm, for example, lymphoblastic lymphoma is also a manifestation of acute lymphocytic leukemia.

The etiology of NHL is poorly understood but may be related to exposure to an infectious agent and/or to proliferation of lymphoid cells as an aberrant, uncontrolled immune response, or it may be associated with exposures that depress the immune system's surveillance and responsiveness, such as HIV infection or treatment with immunosuppressive drugs. For example, the Epstein-Barr virus is associated with Burkitt lymphoma.[2] Overall, the AIDS epidemic of the last two decades has had only a very minor role in increasing NHL rates in Canada.[3] An uncommon form of NHL (MALT lymphoma) is associated with infection with *Helicobacter pylori*[4] and provides a rare example of a cancer that can, at least in some cases, be controlled by antibiotics. Although not always consistent, epidemiologic studies suggest an increased risk of NHL with exposure to dioxins and phenoxy herbicides.[5,6] Because of our limited understanding of the causes of NHL, it is not yet possible to prevent the disease overall, thus the search for the cause of the increasing rates remains an important and active area of research.

Incidence rates for non-Hodgkin's lymphoma have increased rapidly since 1974.

Table 16

Average Annual Percent Change (AAPC) in Age-Standardized Incidence (1991-1998) and Mortality (1991-1999) Rates for Non-Hodgkin's Lymphoma, by Age group and Gender, Canada

Age Group	AAPC in Incidence 1991-1998			AAPC in Mortality 1991-1999		
	Total	M	F	Total	M	F
0-19	-2.5	-2.6	-1.8	-3.9	-5.1**	-1.2
20-29	1.0	1.4	0.4	3.5	3.3	4.6
30-39	1.0	-0.2	3.0*	0.3	0.0	0.5
40-49	0.8	-0.3	2.6*	-1.2	-1.5	-0.8
50-59	1.3*	2.1*	0.3	-0.5	1.0	-2.6**
60-69	2.1**	1.7*	2.6*	1.2	1.4	0.9
70-79	1.1*	1.0	1.2*	1.8*	2.7*	0.6
80+	2.2**	3.2**	0.9	2.4**	2.7**	2.0*
All ages	**1.4****	**1.3****	**1.5****	**1.3****	**1.7****	**0.6**

* Significant at p = 0.05

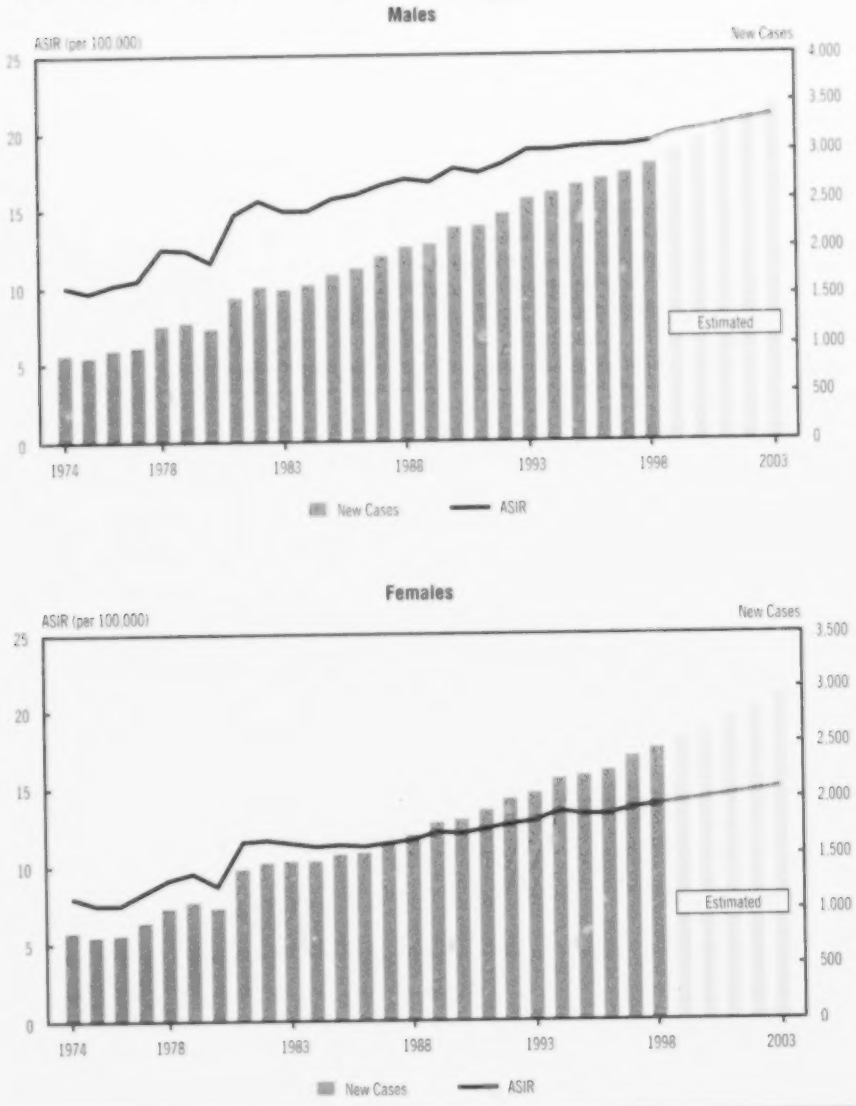
** Significant at p = 0.01

Note: A Poisson regression model was used for AAPC for mortality ages 0-19, since no deaths were observed among females in this age range during 1999.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 10.1

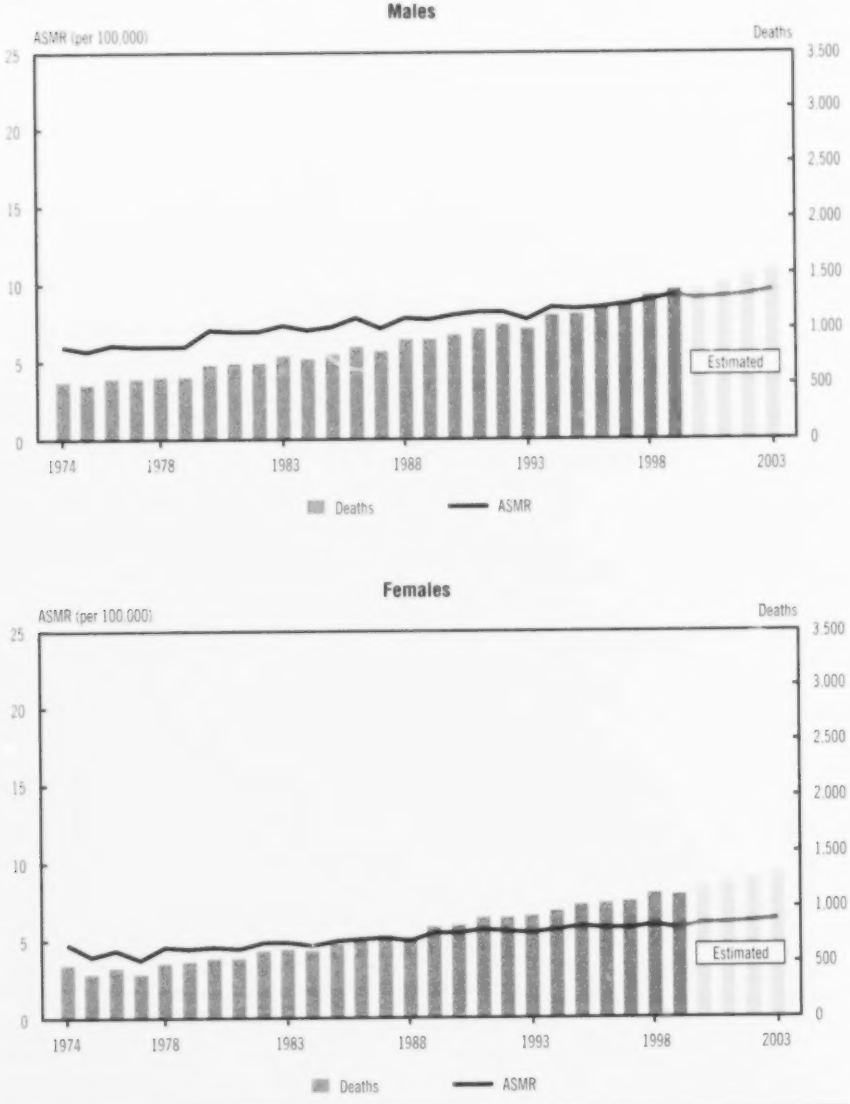
New Cases and Age-Standardized Incidence Rates (ASIR) for Non-Hodgkin's Lymphoma, Canada, 1974-2003



Note: Rates are standardized to the 1991 Canadian population.
Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 10.2

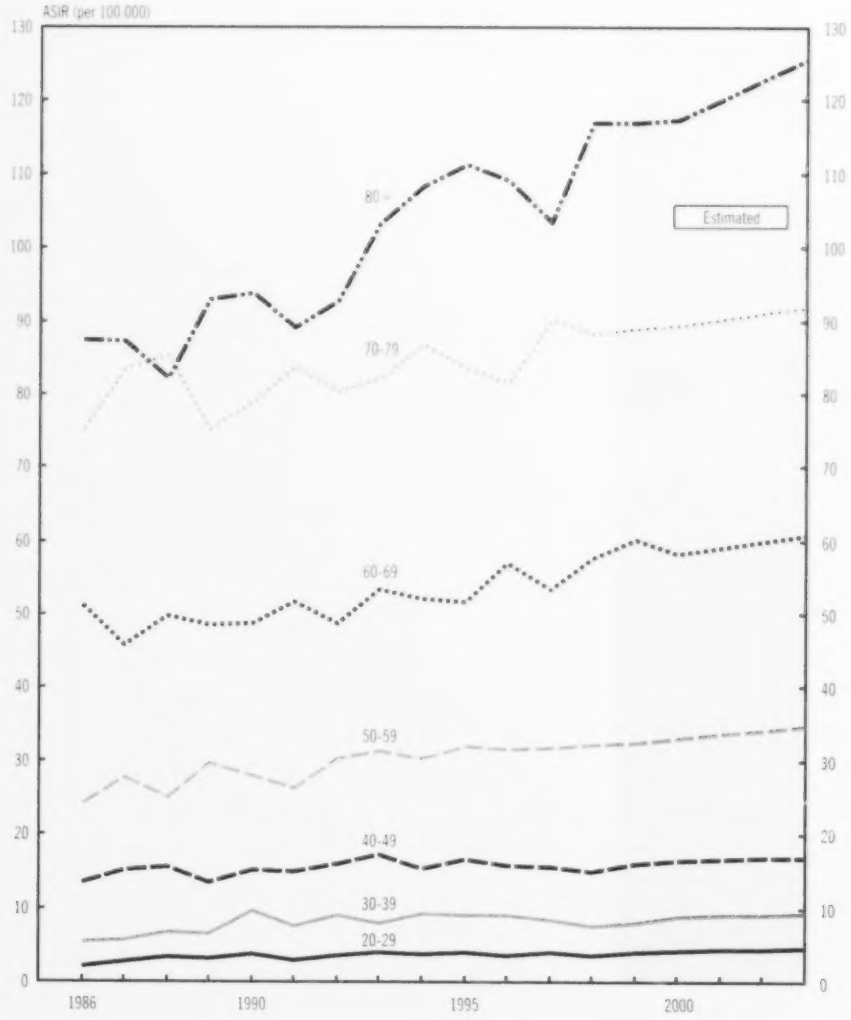
Deaths and Age-Standardized Mortality Rates (ASMR) for Non-Hodgkin's Lymphoma, Canada, 1974-2003



Note: Rates are standardized to the 1991 Canadian population.
Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 10.3

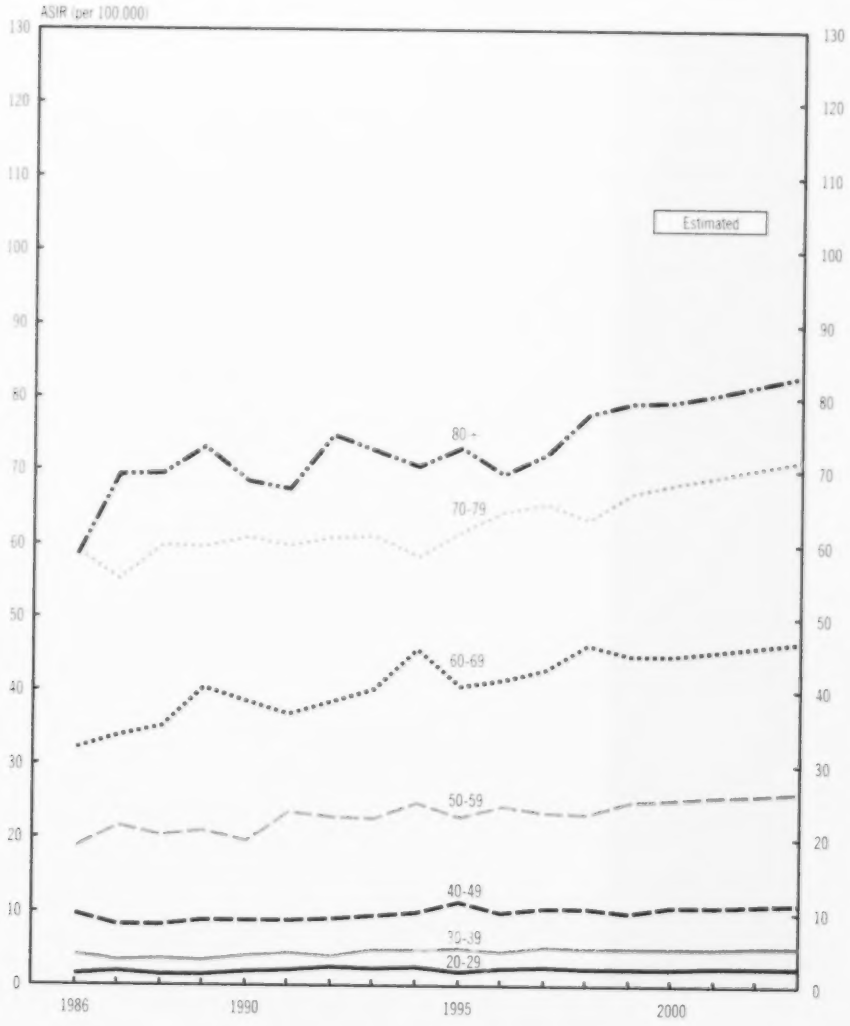
Age-Standardized Incidence Rates (ASIR) for Non-Hodgkin's Lymphoma, Males, 10-year Age Groups, Canada, 1986-2003



Note: Rates are standardized to the age distribution of the 1991 Canadian population.
Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 10.4

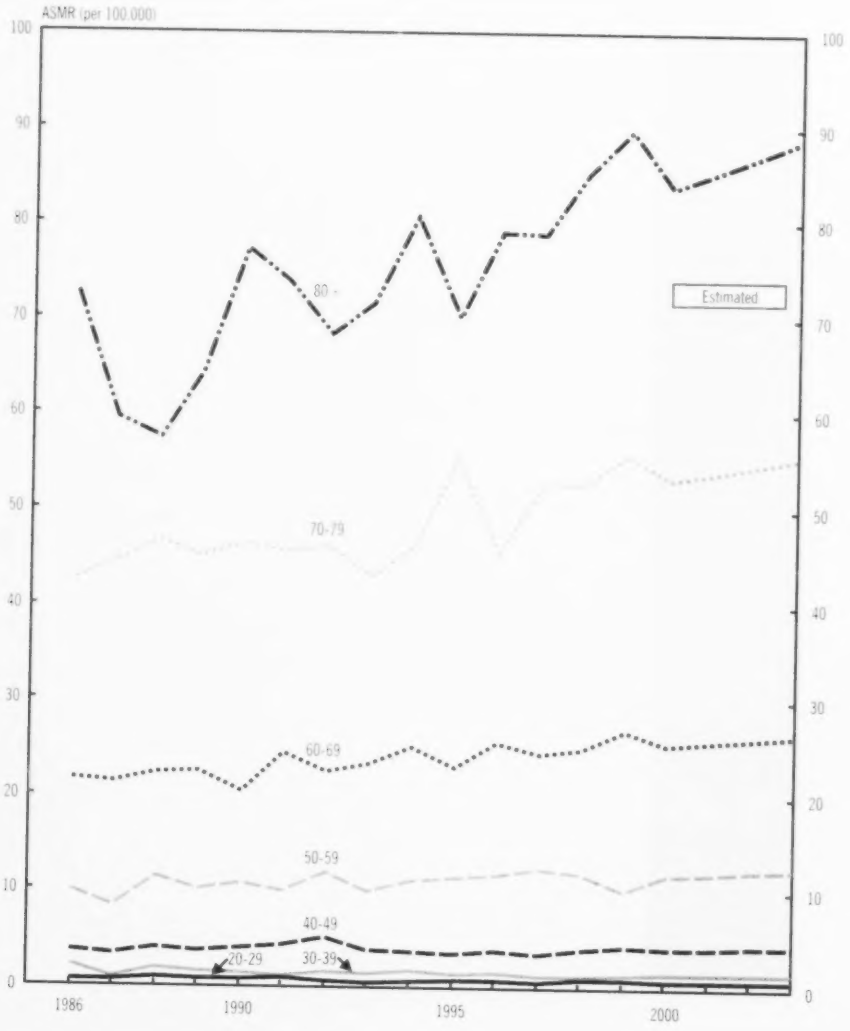
Age-Standardized Incidence Rates (ASIR) for Non-Hodgkin's Lymphoma, Females, 10-year Age Groups, Canada, 1986-2003



Note: Rates are standardized to the age distribution of the 1991 Canadian population.
Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 10.5

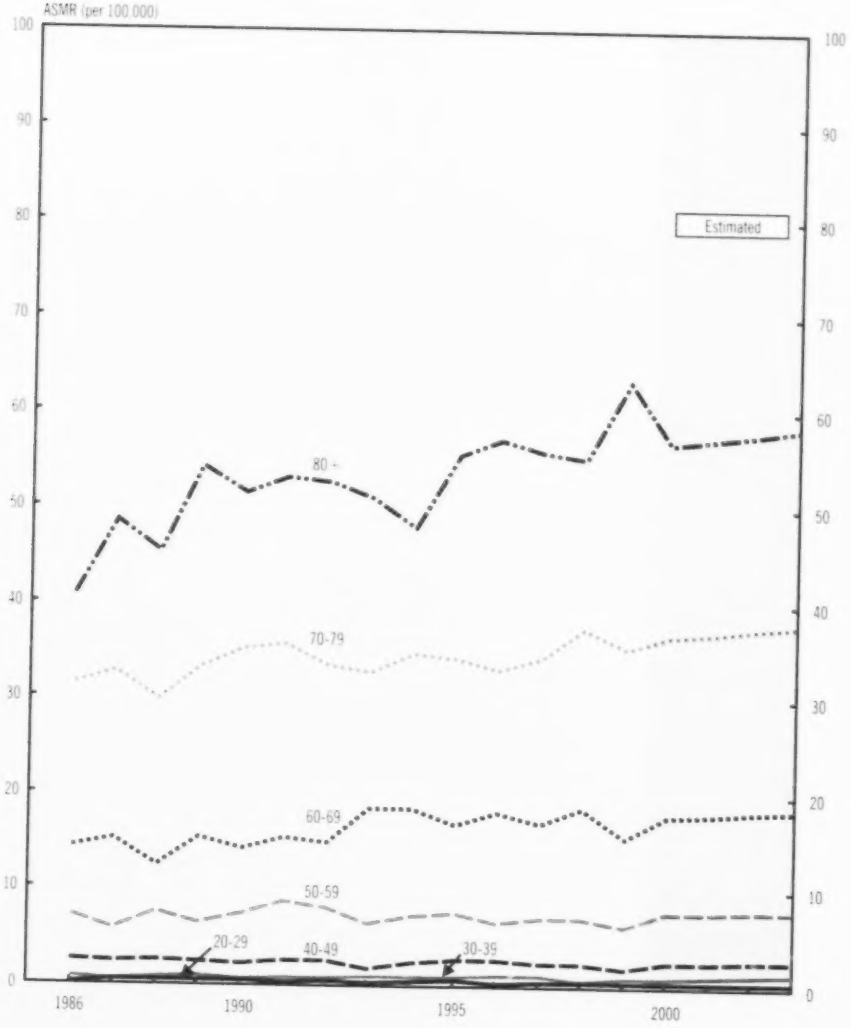
Age-Standardized Mortality Rates (ASMR) for Non-Hodgkin's Lymphoma, Males, 10-year Age Groups, Canada, 1986-2003



Note: Rates are standardized to the age distribution of the 1991 Canadian population.
Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 10.6

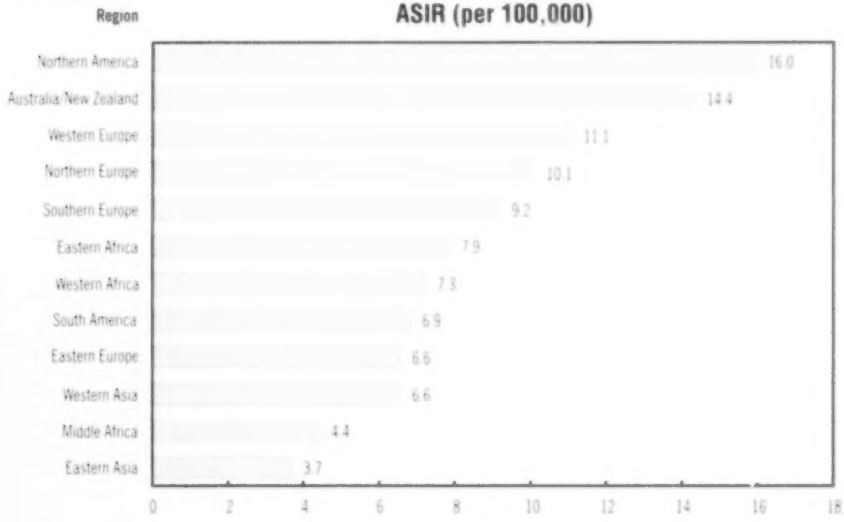
Age-Standardized Mortality Rates (ASMR) for Non-Hodgkin's Lymphoma, Females, 10-year Age Groups, Canada, 1986-2003

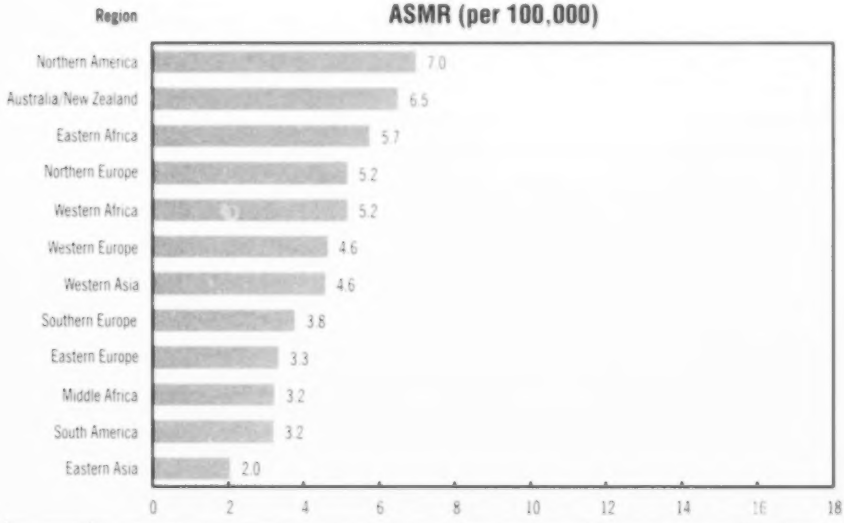


Note: Rates are standardized to the age distribution of the 1991 Canadian population.
Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 10.7

Age-Standardized Incidence Rates (ASIR) and Mortality Rates (ASMR) for Non-Hodgkin's Lymphoma by Selected WHO Region, Males, 2000 Estimates





Note: Regions are defined by the World Health Organization, and rates are standardized to the world population. Reference: GLOBOCAN 2000: Lyon, IARCPress, 2001.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 10.8

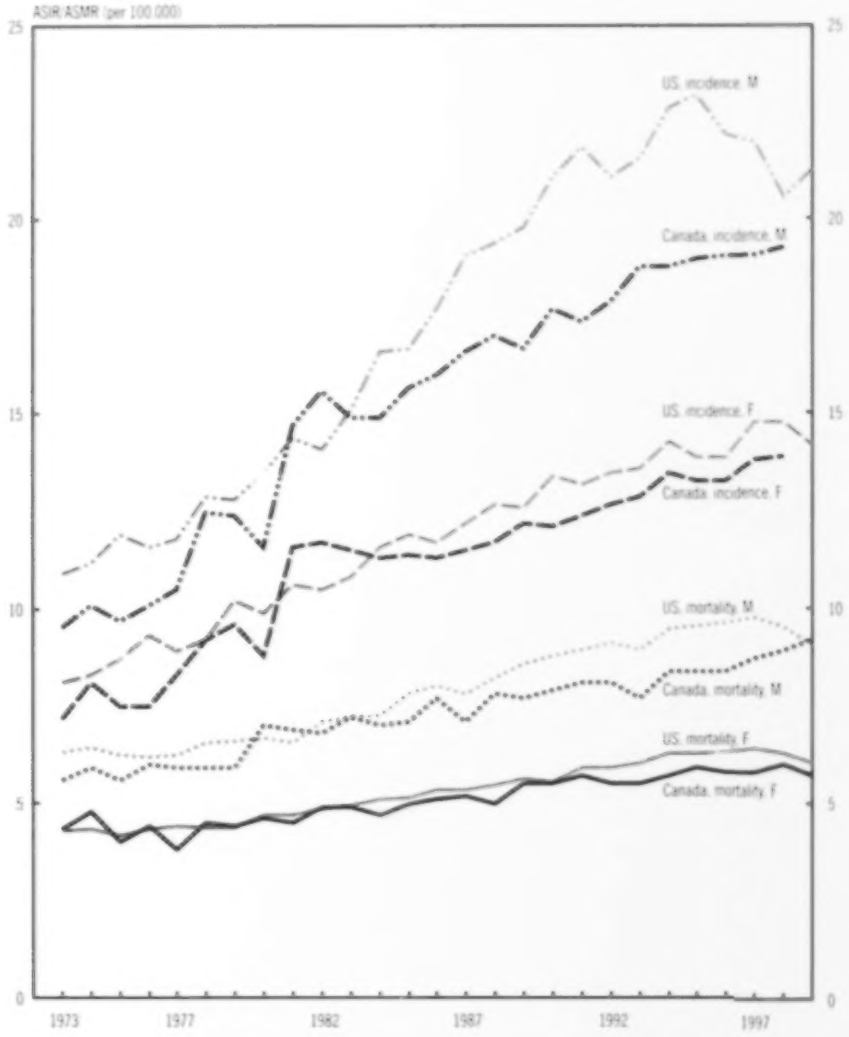
Age-Standardized Incidence Rates (ASIR) and Mortality Rates (ASMR) for Non-Hodgkin's Lymphoma by Selected WHO Region, Females, 2000 Estimates

Note: Regions are defined by the World Health Organization, and rates are standardized to the world population. Reference: GLOBOCAN 2000: Lyon, IARCPress, 2001.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 10.9

Age-Standardized Incidence and Mortality Rates (ASIR and ASMR) for Non-Hodgkin's Lymphoma, Canada and United States,1973-1999



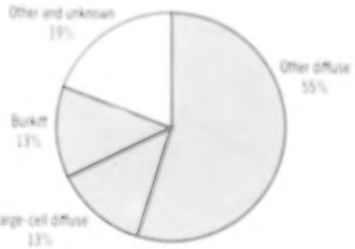
Note: Rates are standardized to the age distribution of the 1991 Canadian population. Incidence for the United Sates is from the 9 SEER Registries area.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

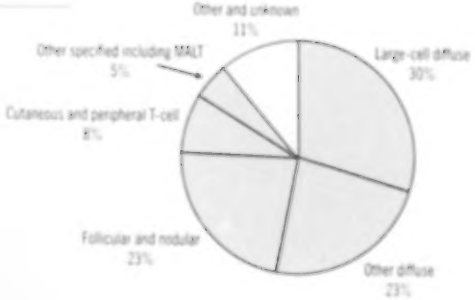
Figure 10.10

Frequencies for Non-Hodgkin's Lymphoma by Sub-type, Males and Females, Canada,1998

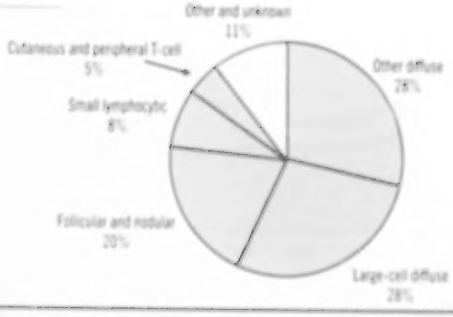
Ages 0-19, N = 80



Ages 20-44, N = 710



Ages 45+, N = 4,500

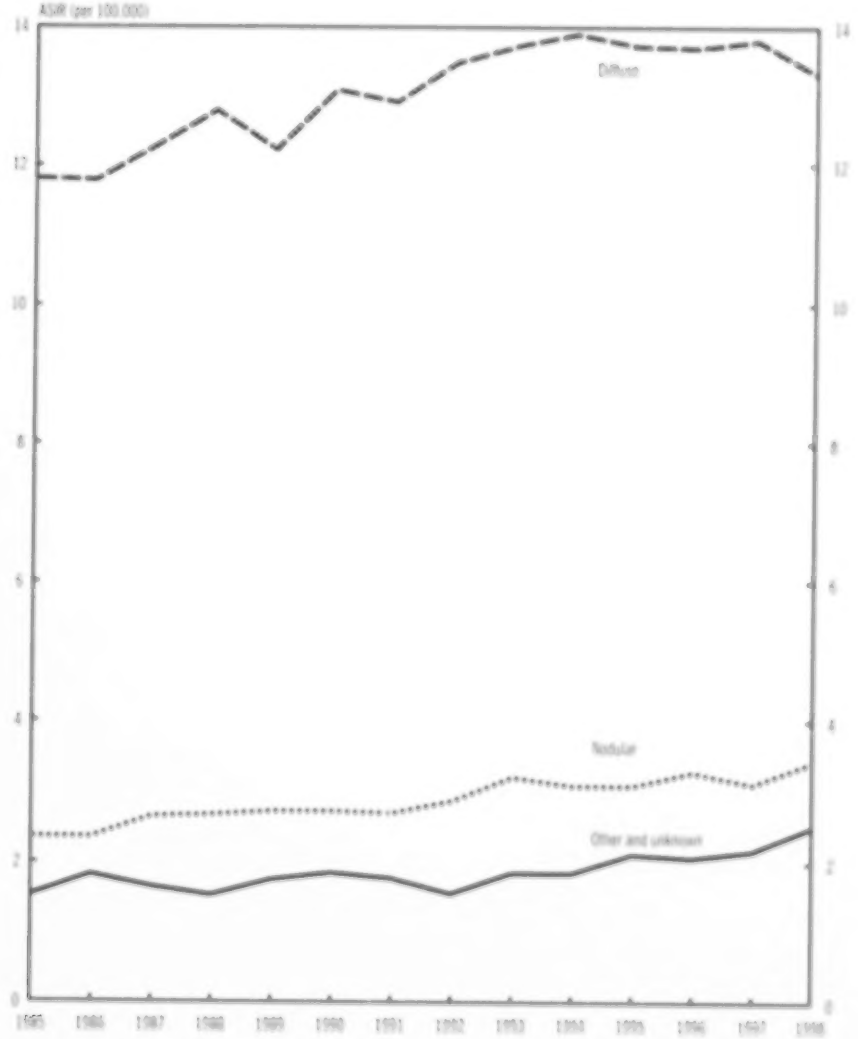


Note: Circle sizes are not dependent on the number of cases. Reference: International Classification of Diseases for Oncology. 2nd Revision. 1990. World Health Organization. Geneva. Switzerland.

Source: Surveillance and Risk Assessment Division. CCDPC. Health Canada

Figure 10.11

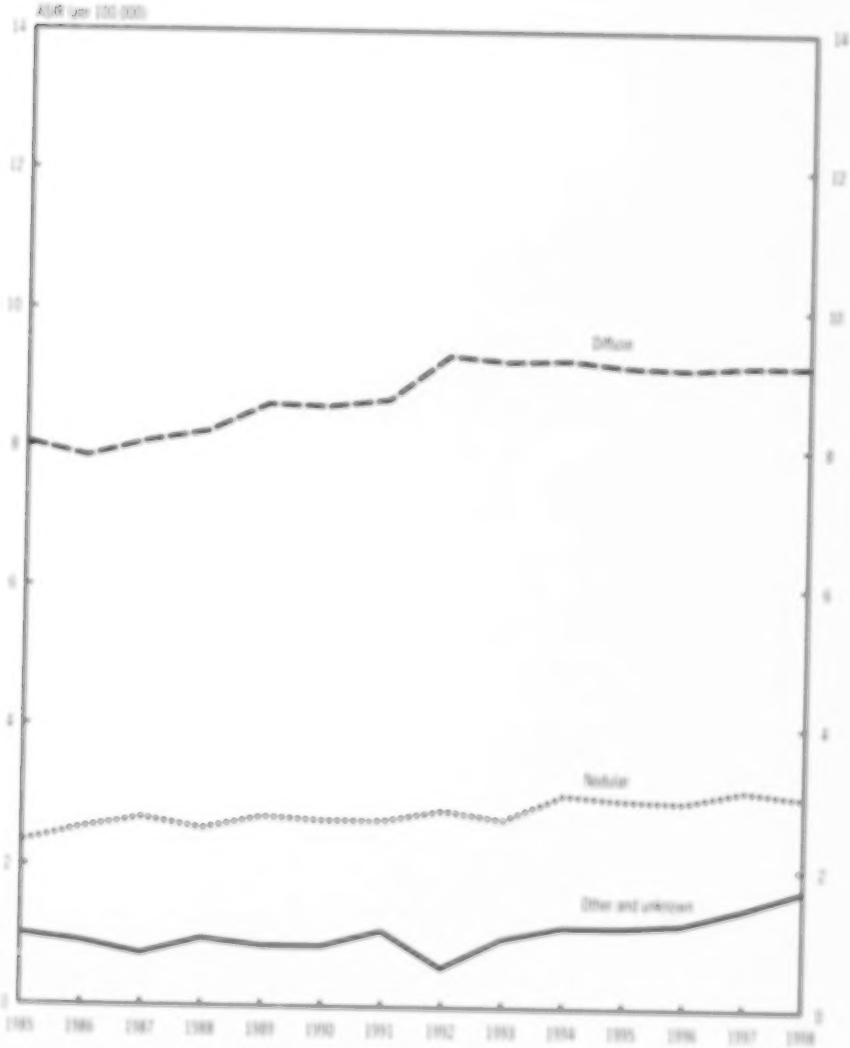
Age-Standardized Incidence Rates (ASIR) for Non-Hodgkin's Lymphoma by Sub-type, Males, Canada,1985-1998



Note: Rates are standardized to the age distribution of the 1991 Canadian population.
Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Figure 10.12

Age-Standardized Incidence Rates (ASIR) for Non-Hodgkin's Lymphoma by Sub-type, Females, Canada,1985-1998



Note: Rates are standardized to the age distribution of the 1991 Canadian population.
Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Age — The age of the patient (in completed years) at the time of diagnosis or death.

ICD-9 — The Ninth Revision of the International Classification of Diseases.[15]

Incidence — The number of new cases of a given type of cancer diagnosed during the year. The basic unit of reporting is a new case of cancer rather than an individual patient.

Mortality — The number of deaths attributed to a particular type of cancer that occurred during the year. Included are deaths of patients whose cancer was diagnosed in earlier years, persons with a new diagnosis during the year, and patients for whom a diagnosis of cancer is made only after death.

Province/Territory — For cancer incidence and mortality data, this is the province/territory of the patient's permanent residence at the time of diagnosis or death, which may or may not correspond to the province/territory in which the new case of cancer or the cancer death was registered.

Incidence and Mortality Rates

Crude rate — The number of new cases of cancer or cancer deaths during the year, expressed as a rate per 100,000 persons in the population.

Age-specific rate — The number of new cases of cancer or cancer deaths during the year, expressed as a rate per 100,000 persons in a given age group.

Age-standardized rate — The number of new cases of cancer or cancer deaths per 100,000 that would have occurred in the standard population (1991 Canadian population) if the actual age-specific rates observed in a given population had prevailed in the standard population.

Index of age-standardized rates — The age-standardized rate of the base year, 1974, is set at 100. Index values for subsequent years are derived by multiplying the age-standardized rate for the year by 100 and then dividing by the 1974 rate.

Prevalence — The proportion of a population that is affected by disease at a given point in time.

GLOSSARY

Site Definitions

Cancer data presented in this monograph are classified according to the following site groupings, except where otherwise noted.

Site	ICD-9	Site	ICD-9
Oral	140-149	Prostate	185
Esophagus/Oesophagus	150	Testis	186
Stomach	151	Bladder	188
Colorectal	153-154, 159.0	Kidney	189
Pancreas	157	Brain	191-192
Larynx	161	Thyroid	193
Lung	162	Lymphoma	200-203
Melanoma	172	Hodgkin's Disease	201
Female Breast	174	Multiple Myeloma	203
Cervix	180	Non-Hodgkin's Lymphoma	200,202
Body of Uterus	179,182	Leukemia	204-208
Ovary	183	All Cancers excluding Lung	140-208 excluding 173,162
		All Other Cancers	All sites between 150-199 not listed above
All Cancers	**140-208 excluding 173**		

1991 Canadian Population/World Standard Population

The population used to standardize rates had the following age distribution.

	Population			Population			Population	
Age Group	Canadian	World Standard	Age Group	Canadian	World Standard	Age Group	Canadian	World Standard
0-4	6,946.4	12,000	30-34	9,240.0	6,000	60-64	4,232.6	4,000
5-9	6,945.4	10,000	35-39	8,338.8	6,000	65-69	3,857.0	3,000
10-14	6,803.4	9,000	40-44	7,606.3	6,000	70-74	2,965.9	2,000
15-19	6,849.5	9,000	45-49	5,953.6	6,000	75-79	2,212.7	1,000
20-24	7,501.6	8,000	50-54	4,764.9	5,000	80-84	1,359.5	500
25-29	8,994.4	8,000	55-59	4,404.1	4,000	85+	1,023.7	500
						TOTAL		100,000

Source: The Canadian population distribution is based on the final post-censal estimates of the July 1, 1991, Canadian population, adjusted for census undercoverage. The World Standard Population is used in *Cancer Incidence in Five Continents*.[1]

APPENDIX I: ACTUAL DATA FOR NEW CASES AND DEATHS

The focus of this monograph is on current year estimates that are obtained by analyzing actual data and making short-term projections using statistical techniques (see *Appendix II*). For users who require *actual data* rather than current year *estimates*, the Tables in this Appendix provide a summary of actual incidence and mortality statistics based on the most recently available data for the nation. These data represent the most recent year in the long series of data that was used to derive the current year estimates.

Appendix Tables A1 and A2 list the actual number of new cases (1998) and deaths (1999) that occurred in Canada, and specify the ICD-9 codes used to define each diagnostic group. Given the reliability of these actual counts, it is feasible to examine the frequency of additional cancer types, thus Appendix Tables A1 and A2 list a larger number of cancer types than the previous Tables. Appendix Tables A3 to A6 list actual values for incidence and mortality counts and rates for major cancer types, by province and territory.

In addition to the explanations and discussion provided earlier in the monograph, several other points need to be made. As noted in Tables A3-A6 of this Appendix, because of the small populations of the Territories, it was only feasible to provide summaries (five-year average) for the most common cancers. The Appendix Tables also indicate that among provinces/territories there was some variation in the years for which data were available (as of August 2002 when these analyses began). Furthermore, the data sources are dynamic files that are routinely updated as new data become available. Ontario cases had not been linked to the Canadian Cancer Registry for 1997-1998; consequently a small change may be expected when this step is complete. Users who require more current, actual data for Canada may contact the Centre for Chronic Disease Prevention and Control at Health Canada, or the Health Statistics Division at Statistics Canada. The most up-to-date data for individual provinces/territories can be obtained by contacting the provincial cancer registries (see section *For Further Information*).

APPENDIX I: ACTUAL DATA FOR NEW CASES AND DEATHS

Table A1

Actual Data for New Cases of Cancer by Site and Gender, Canada, 1998

Site	ICD-9	Total	Males	Females
All Cancer Sites	**140-208**	**125,875**	**64,511**	**61,364**
Oral (Buccal Cavity and Pharynx)	**140-149**	**2,926**	**2,014**	**912**
Lip	140	467	379	88
Tongue	141	579	387	192
Salivary Gland	142	330	190	140
Floor of Mouth	144	220	155	65
Pharynx	146,147,148	790	587	203
Other and Unspecified	143,145,149	540	316	224
Digestive Organs	**150-159**	**27,078**	**14,639**	**12,439**
Esophagus	150	1,177	849	328
Stomach	151	2,857	1,799	1,058
Small Intestine	152	397	210	187
Large Intestine	153	11,287	5,585	5,702
Rectum	154	5,600	3,272	2,328
Liver and Biliary Passages	155,156	2,010	1,103	907
Pancreas	157	3,014	1,474	1,540
Intestinal Tract, Part Unspecified	159.0	157	70	87
Other and Unspecified	158,159.1-159.9	579	277	302
Respiratory System	**160-165**	**20,973**	**12,922**	**8,051**
Larynx	161	1,184	968	216
Lung	162	19,085	11,470	7,615
Other and Unspecified	160,163,164,165	704	484	220
Bone Tissue and Skin	**170-172**	**4,344**	**2,249**	**2,095**
Bone	170	282	149	133
Connective Tissue	171	801	439	362
Skin (melanoma)	172	3,261	1,661	1,600
Breast	**174,175**	**18,155**	**132**	**18,023**
Genital Organs	**179-187**	**24,597**	**17,000**	**7,597**
Uterus, Part Unspecified	179	88	–	88
Cervix	180	1,345	–	1,345
Body of Uterus	182	3,306	–	3,306
Ovary	183	2,310	–	2,310
Prostate	185	16,168	16,168	–
Testis	186	667	667	–
Other and Unspecified	181,184,187	713	165	548
Urinary Organs	**188-189**	**8,216**	**5,589**	**2,627**
Bladder	188	4,665	3,390	1,275
Kidney and Other Urinary	189	3,551	2,199	1,352
Eye	**190**	**263**	**135**	**128**
Brain and Central Nervous System	**191-192**	**2,190**	**1,214**	**976**
Endocrine Glands	**193-194**	**1,863**	**486**	**1,377**
Thyroid	193	1,717	420	1,297
Other Endocrine	194	146	66	80
Leukemia	**204-208**	**3,354**	**1,906**	**1,448**
Other Blood and Lymph Tissues	**200-203**	**7,713**	**4,165**	**3,548**
Hodgkin's Disease	201	765	422	343
Multiple Myeloma	203	1,617	880	737
Non-Hodgkin's Lymphoma	200, 202	5,331	2,863	2,468
All Other and Unspecified Sites	**195-199**	**4,203**	**2,060**	**2,143**

– Not applicable

Note: ICD-9 refers to the Ninth Revision of the International Classification of Diseases. Figures exclude non-melanoma skin cancer (ICD-9 173). Further information is available at: **http://www.hc-sc.gc.ca/pphb-dgspsp** (select Disease Surveillance On-Line button). Amended November 2001

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Table A2

Actual Data for Cancer Deaths by Site and Gender, Canada, 1999

Site	ICD-9	Total	Males	Females
All Cancer Sites	**140-208**	**61,650**	**33,026**	**28,624**
Oral (Buccal Cavity and Pharynx)	**140-149**	**1,005**	**698**	**307**
Lip	140	15	12	3
Tongue	141	242	158	84
Salivary Gland	142	91	54	37
Floor of Mouth	144	26	21	5
Pharynx	146,147,148	281	210	71
Other and Unspecified	143,145,149	350	243	107
Digestive Organs	**150-159**	**16,371**	**8,978**	**7,393**
Esophagus	150	1,324	955	369
Stomach	151	1,992	1,208	784
Small Intestine	152	133	70	63
Large Intestine	153	5,055	2,612	2,443
Rectum	154	1,453	860	593
Liver and Biliary Passages	155,156	1,780	1,016	764
Pancreas	157	3,054	1,531	1,523
Intestinal Tract, Part Unspecified	159.0	1,303	621	682
Other and Unspecified	158,159.1-159.9	227	105	172
Respiratory System	**160-165**	**17,387**	**10,797**	**6,590**
Larynx	161	481	388	93
Lung	162	16,713	10,276	6,437
Other and Unspecified	160,163,164,165	193	133	60
Bone Tissue and Skin	**170-172**	**1,262**	**710**	**552**
Bone	170	132	73	59
Connective Tissue	171	410	201	209
Skin (melanoma)	172	720	436	284
Breast	**174,175**	**4,800**	**38**	**4,762**
Genital Organs	**179-187**	**6,297**	**3,666**	**2,631**
Uterus, Part Unspecified	179	336	–	336
Cervix	180	422	–	422
Body of Uterus	182	324	–	324
Ovary	183	1,399	–	1,399
Prostate	185	3,601	3,601	–
Testis	186	37	37	–
Other and Unspecified	181,184,187	178	28	150
Urinary Organs	**188-189**	**2,800**	**1,871**	**929**
Bladder	188	1,471	1,038	433
Kidney and Other Urinary	189	1,329	833	496
Eye	**190**	**31**	**17**	**14**
Brain and Central Nervous System	**191-192**	**1,543**	**861**	**682**
Endocrine Glands	**193-194**	**206**	**92**	**114**
Thyroid	193	134	49	85
Other Endocrine	194	72	43	29
Leukemia	**204-208**	**2,089**	**1,194**	**895**
Other Blood and Lymph Tissues	**200-203**	**3,708**	**1,985**	**1,723**
Hodgkin's Disease	201	142	84	58
Multiple Myeloma	203	1,112	552	560
Non-Hodgkin's Lymphoma	200, 202	2,454	1,349	1,105
All Other and Unspecified Sites	**173,195-199**	**4,151**	**2,119**	**2,032**

– Not applicable

Note: ICD-9 refers to the Ninth Revision of the International Classification of Diseases.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

APPENDIX I: ACTUAL DATA FOR NEW CASES AND DEATHS

Table A3

Actual Data for New Cases for Major Cancer Sites by Gender and Geographic Region, Most Recent Year,[1] Canada

	New Cases												
	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nu.
Males														
All Cancers	**64,500**	**1,100**	**350**	**2,500**	**1,900**	**15,700**	**24,500**	**2,600**	**2,500**	**5,500**	**9,200**	**35**	**35**	**20**
Prostate	16,200	270	85	660	510	2,800	6,600	660	760	1,650	2,900	5	5	–
Lung	11,500	170	55	490	380	3,600	3,900	420	370	820	1,350	5	5	10
Colorectal	8,900	200	50	330	240	2,200	3,300	370	300	700	1,200	5	10	5
Bladder	3,400	40	15	190	140	1,150	1,150	120	160	180	360	–	–	–
Non-Hodgkin's Lymphoma	2,900	40	15	100	80	690	1,100	110	100	250	400	–	5	–
Kidney	2,200	30	15	85	75	560	870	120	75	220	240	–	–	–
Oral	2,000	55	10	75	50	480	780	100	70	180	230	–	–	–
Leukemia	1,900	25	15	60	55	470	740	80	95	190	230	–	–	–
Stomach	1,800	60	10	70	40	470	670	75	65	140	210	–	–	–
Melanoma	1,650	20	15	100	65	210	750	75	65	210	270	–	–	–
Pancreas	1,450	15	10	55	50	430	480	70	45	100	240	–	–	–
Brain	1,200	30	10	35	35	330	460	50	45	95	170	–	–	–
Larynx	970	15	5	25	30	330	320	30	25	50	120	–	–	–
Multiple Myeloma	880	5	5	25	20	220	370	35	25	55	120	–	–	–
Females														
All Cancers	**61,400**	**850**	**290**	**2,200**	**1,650**	**15,700**	**23,400**	**2,500**	**2,200**	**5,100**	**7,900**	**35**	**35**	**20**
Breast	18,000	270	85	620	470	4,700	6,700	740	610	1,650	2,500	15	10	–
Colorectal	8,100	150	40	310	240	2,100	3,100	340	280	530	990	–	5	–
Lung	7,600	65	50	310	220	2,000	2,800	310	270	590	1,000	5	5	5
Body of Uterus	3,400	55	10	120	90	860	1,300	170	120	310	420	–	–	–
Non-Hodgkin's Lymphoma	2,500	25	5	80	90	600	960	110	100	190	310	–	–	–
Ovary	2,300	25	10	75	40	570	960	70	65	140	290	–	–	–
Melanoma	1,600	25	15	100	80	220	670	45	60	210	240	–	–	–
Pancreas	1,550	5	10	70	45	430	530	50	45	120	220	–	–	–
Leukemia	1,450	20	5	35	35	340	610	65	65	120	190	–	–	–
Cervix	1,350	20	5	60	35	280	480	50	55	130	180	–	–	–
Kidney	1,350	20	5	65	35	360	510	60	60	120	150	–	–	–
Bladder	1,300	5	–	70	35	430	430	30	70	55	110	–	–	–
Thyroid	1,300	25	–	30	25	290	600	55	35	120	130	–	–	–
Stomach	1,050	15	–	30	30	310	370	35	40	90	120	–	–	–
Brain	980	15	5	30	25	270	400	45	35	75	130	–	–	–
Oral	910	15	5	25	15	230	340	40	25	70	130	–	–	–
Multiple Myeloma	740	5	5	25	20	190	330	40	25	35	95	–	–	–

– Fewer than 3 cases

1998 for Canada, Quebec, Ontario; 1999 for Newfoundland, Prince Edward Island, Nova Scotia, New Brunswick, Manitoba, Saskatchewan, Alberta, British Columbia; 1995-1999 average for Yukon, Northwest Territories, Nunavut

Note: Total of rounded numbers may not equal rounded total number, and an average is used for the territories. Counts exclude cases of non-melanoma skin cancer (ICD-9 173). Amended November 2001.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Table A4

Actual Age-Standardized Incidence Rates for Major Cancer Sites by Gender and Geographic Region, Most Recent Year,[1] Canada

	Rate per 100,000													
	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nu.
Males														
All Cancers	**446**	**418**	**499**	**539**	**512**	**456**	**448**	**450**	**448**	**443**	**444**	**350**	**365**	**432**
Prostate	114	106	124	140	137	83	122	115	137	136	143	58	54	–
Lung	79	65	78	105	103	105	70	72	67	67	66	83	72	187
Colorectal	62	76	72	69	63	63	61	64	54	57	58	55	91	101
Bladder	24	17	22	40	37	34	21	21	29	16	18	–	–	–
Non-Hodgkin's Lymphoma	19	14	22	22	21	19	20	18	19	19	19	–	23	–
Kidney	15	12	23	18	20	16	16	21	14	17	11	–	–	–
Oral	13	21	15	16	13	13	14	17	13	14	11	–	–	–
Stomach	13	23	13	14	11	14	12	13	12	12	10	–	–	–
Leukemia	13	9	20	13	15	14	14	14	18	15	11	–	–	–
Melanoma	11	8	24	21	16	6	13	13	12	15	13	–	–	–
Pancreas	10	5	16	11	13	13	9	12	8	8	11	–	–	–
Brain	8	10	11	8	9	9	8	9	9	7	8	–	–	–
Larynx	7	4	7	5	8	9	6	5	5	4	6	–	–	–
Multiple Myeloma	6	2	5	5	6	7	7	6	5	4	6	–	–	–
Females														
All Cancers	**346**	**277**	**340**	**376**	**356**	**349**	**350**	**359**	**342**	**343**	**324**	**351**	**324**	**439**
Breast	103	85	105	105	102	106	101	110	100	110	102	107	87	–
Colorectal	44	49	43	49	49	44	45	45	40	35	39	–	72	–
Lung	43	22	63	51	48	44	41	46	43	41	41	49	47	213
Body of Uterus	19	17	13	20	19	19	19	26	20	21	17	–	–	–
Non-Hodgkin's Lymphoma	14	8	7	14	19	13	14	16	15	13	13	–	–	–
Ovary	13	8	12	13	9	13	15	10	11	9	12	–	–	–
Melanoma	9	8	22	19	19	5	10	7	10	14	10	–	–	–
Pancreas	8	2	7	11	8	9	7	6	6	8	9	–	–	–
Cervix	8	7	8	12	8	7	8	8	11	9	8	–	–	–
Thyroid	8	7	–	6	7	7	10	9	7	8	6	–	–	–
Kidney	8	8	7	11	7	8	8	8	9	8	6	–	–	–
Leukemia	8	7	4	6	8	8	9	10	11	8	8	–	–	–
Bladder	7	2	–	11	7	9	6	4	12	4	4	–	–	–
Stomach	6	5	–	5	6	6	5	4	6	6	5	–	–	–
Brain	6	5	6	5	6	6	6	7	6	5	6	–	–	–
Oral	5	5	5	4	3	5	5	6	4	5	6	–	–	–
Multiple Myeloma	4	1	4	4	4	4	5	5	3	2	4	–	–	–

– Age-standardized incidence rate is based on less than 3 cases per year

1 1998 for Canada, Quebec, Ontario; 1999 for Newfoundland, Prince Edward Island, Nova Scotia, New Brunswick, Manitoba, Saskatchewan, Alberta, British Columbia; 1995-1999 average for Yukon, Northwest Territories, Nunavut

Note: Rates exclude non-melanoma skin cancer (ICD-9 173) and are adjusted to the age distribution of the 1991 Canadian population. Amended November 2001

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

APPENDIX I: ACTUAL DATA FOR NEW CASES AND DEATHS

Table A5

Actual Data for Deaths for Major Cancer Sites by Gender and Geographic Region, Canada, 1999[1]

	Deaths												
	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nu.
Males														
All Cancers	**33,000**	**660**	**160**	**1,250**	**890**	**9,000**	**12,000**	**1,350**	**1,250**	**2,400**	**4,100**	**20**	**20**	**15**
Lung	10,300	210	55	420	280	3,300	3,400	380	370	690	1,150	5	5	5
Colorectal	4,100	90	20	140	120	1,100	1,500	180	160	270	480	–	5	–
Prostate	3,600	75	20	140	100	790	1,300	150	230	280	510	–	–	–
Pancreas	1,550	30	10	60	50	400	540	60	55	95	220	–	–	–
Non-Hodgkin's Lymphoma	1,350	15	5	45	35	320	520	80	45	100	180	–	–	–
Stomach	1,200	40	5	25	35	360	430	55	40	80	130	–	–	–
Leukemia	1,200	20	5	50	30	270	470	55	45	100	140	–	–	–
Bladder	1,050	20	5	50	30	240	410	40	45	60	140	–	–	–
Brain	860	20	–	35	15	250	310	35	30	65	100	–	–	–
Kidney	830	20	10	30	20	220	280	50	25	60	120	–	–	–
Oral	700	15	5	25	15	190	270	25	10	60	85	–	–	–
Multiple Myeloma	550	5	5	15	10	150	220	20	20	40	70	–	–	–
Melanoma	440	5	–	20	10	70	210	15	10	35	65	–	–	–
Larynx	390	5	–	10	15	160	140	15	10	15	25	–	–	–
Females														
All Cancers	**28,600**	**490**	**150**	**1,050**	**720**	**7,500**	**10,700**	**1,200**	**990**	**2,200**	**3,500**	**15**	**15**	**15**
Lung	6,400	90	30	270	170	1,700	2,300	250	240	490	870	5	5	5
Breast	4,800	70	30	190	110	1,250	1,800	190	150	390	580	5	–	–
Colorectal	3,700	80	25	150	90	1,000	1,450	160	110	240	400	–	5	–
Pancreas	1,500	25	10	55	40	400	530	80	65	110	200	–	–	–
Ovary	1,400	35	10	45	35	330	520	50	50	110	200	–	–	–
Non-Hodgkin's Lymphoma	1,100	15	5	35	35	280	410	55	45	85	140	–	–	–
Leukemia	900	10	5	25	10	210	370	40	30	75	120	–	–	–
Stomach	780	20	–	25	20	240	270	25	30	60	90	–	–	–
Brain	680	15	–	15	20	210	250	30	20	45	80	–	–	–
Body of Uterus	660	10	5	15	20	210	250	25	25	40	70	–	–	–
Multiple Myeloma	560	5	5	10	15	140	230	30	15	30	75	–	–	–
Kidney	500	15	–	10	15	150	150	30	20	45	65	–	–	–
Bladder	430	5	–	15	5	130	160	15	15	25	60	–	–	–
Cervix	420	15	5	15	10	90	160	20	20	40	45	–	–	–
Oral	310	5	–	5	10	80	120	5	10	25	40	–	–	–
Melanoma	280	5	–	10	5	65	130	15	10	20	30	–	–	–

– Fewer than 3 cases

[1] 1995-1999 average for Yukon, Northwest Territories, Nunavut

Note: Total of rounded numbers may not equal rounded total number, and an average is used for the territories.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada

Table A6

Actual Age-Standardized Mortality Rates for Major Cancer Sites by Gender and Geographic Region, Canada, 1999[1]

	Rate per 100,000													
	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nu.
Males														
All Cancers	**229**	**262**	**235**	**264**	**239**	**263**	**221**	**230**	**218**	**198**	**199**	**241**	**210**	**366**
Lung	70	79	79	90	73	94	62	65	66	57	56	85	69	150
Colorectal	28	36	30	30	33	33	28	30	27	23	23	–	29	–
Prostate	27	32	26	30	27	26	26	25	38	26	26	–	–	–
Pancreas	11	12	16	13	14	12	10	10	9	8	11	–	–	–
Non-Hodgkin's Lymphoma	9	5	7	10	10	9	9	14	8	8	9	–	–	–
Stomach	8	17	9	6	10	11	8	9	7	7	6	–	–	–
Leukemia	8	8	5	11	8	8	9	10	9	8	7	–	–	–
Bladder	7	9	6	10	8	8	8	7	7	5	7	–	–	–
Brain	6	8	–	8	4	7	5	6	5	5	5	–	–	–
Kidney	6	8	17	6	5	6	5	8	5	5	6	–	–	–
Oral	5	6	4	5	4	5	5	4	2	5	4	–	–	–
Multiple Myeloma	4	3	4	3	3	4	4	4	4	3	3	–	–	–
Larynx	3	3	–	2	3	4	2	2	2	1	1	–	–	–
Melanoma	3	2	–	4	2	2	4	3	2	3	3	–	–	–
Females														
All Cancers	**149**	**157**	**170**	**164**	**144**	**156**	**148**	**154**	**142**	**148**	**138**	**175**	**205**	**304**
Lung	35	30	33	43	37	37	33	35	36	34	35	47	49	166
Breast	25	23	34	31	22	26	25	26	22	26	23	35	–	–
Colorectal	19	25	25	22	17	20	19	20	15	15	15	–	34	–
Pancreas	8	8	8	8	7	8	7	10	8	7	8	–	–	–
Ovary	7	12	9	7	8	7	7	7	7	8	8	–	–	–
Non-Hodgkin's Lymphoma	6	4	7	6	6	6	6	7	6	6	5	–	–	–
Leukemia	5	3	5	4	2	4	5	6	4	5	5	–	–	–
Stomach	4	7	–	4	4	5	4	3	4	4	3	–	–	–
Brain	4	4	–	3	4	5	4	4	3	3	3	–	–	–
Body of Uterus	3	3	4	2	4	4	3	3	3	2	3	–	–	–
Multiple Myeloma	3	2	3	1	3	3	3	3	2	2	3	–	–	–
Kidney	3	4	–	2	3	3	2	4	3	3	2	–	–	–
Oral	2	1	–	1	2	2	2	1	2	2	2	–	–	–
Melanoma	2	1	–	2	1	1	2	1	1	1	1	–	–	–
Cervix	2	4	5	3	3	2	2	3	4	3	2	–	–	–
Bladder	2	2	–	2	1	3	2	2	2	2	2	–	–	–

– Age-standardized mortality rate is based on less than 3 deaths per year.

1 1995-1999 average for Yukon, Northwest Territories, Nunavut.

Note: Rates are adjusted to the age distribution of the 1991 Canadian population.

Source: Surveillance and Risk Assessment Division, CCDPC, Health Canada.

Data Sources and Processing

The actual cancer incidence and mortality data used in this monograph were obtained from four sources: mortality data files (1950-1999),[16,17] the National Cancer Incidence Reporting System (NCIRS, 1969-1991),[1] the Canadian Cancer Registry (CCR, 1992-1999)[1] (the Health Statistics Division at Statistics Canada maintains all these databases) and the Ontario Cancer Registry (Ontario cancer incidence data for 1997-1998).

Actual incidence and mortality data were available at Health Canada for all the provinces and territories except Ontario and Quebec for the period 1969 to 1999. Ontario and Quebec incidence data were available only until 1998.

Records from each province were extracted and then classified by gender, age group and selected cancer site as defined in the *Glossary*. Canada totals for selected sites were then determined as the sum of the 10 provinces and three territories.

Population figures for Canada, the provinces and the territories were taken from intercensal estimates for the period 1971 to 1996,[18,19] from postcensal estimates for the **period 1997-2001**,[19] and from the Scenario 2 population projections for **2002 and 2003**.[19] The population estimates from **1971 to 2001** and the population projections include non-permanent residents as part of the population. In addition, adjustments are made for net census undercoverage and returning Canadians, and the reference date for the annual estimates is July 1 instead of June 1. The population projections incorporate assumptions of natural increase, immigration and internal migration, which closely reflect the Canadian reality. These assumptions are regularly updated to take into account the most recent changes.

Incidence and mortality estimates for 2003 were extrapolated from models that were fitted to a subset of the data described above. The data series were selected so that they begin in 1986 for both incidence and mortality. This allows consistency between the mortality and incidence estimates and ensures that the estimates accurately account for current trends. For mortality estimates, data from 1986 to 1999 were used. For incidence estimates, data from 1986 to the latest year of available data were used.

Actual incidence and mortality rates for each province territory, gender, site and year were computed by dividing the number of cases by the corresponding provincial territorial population figures. In previous editions, these rates were computed for the "under 45" and the "45 and over" age groups separately. In order to study the age distributions of all cancers and of the leading types of cancer (lung, colorectal, prostate and breast), age specific rates were computed for the age groups 0-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70-79, and 80 years and over. For this edition, rates were computed and analyzed by five year age groups 0-4, 5-9, 10-14, up to 80-84, and 85 years of age and older.

Age-standardized incidence and mortality rates for each site were calculated using the age distribution of the 1991 Canadian population. The World Standard Population[4] was used in publications before 1995. It was replaced because it is much younger than the 1991 Canadian population. Consequently, estimates of age-standardized rates before 1995 are not comparable with later estimates.

Commencing with the 2000 edition of *Canadian Cancer Statistics*, the Northwest Territories represent a different geographic area than in the past. Its geographic boundaries were redrawn, reducing the land area representing the Northwest Territories, and a new territory named Nunavut was incorporated.[20]

For all cancers, even those with poor survival such as pancreas and lung, the annual number of incident cases is expected to be similar to or larger than the number of deaths. However, there are situations in which the number of deaths either observed or projected is larger than the corresponding number of new cases. In the case of Newfoundland and Labrador, this is caused by the Registry not receiving information on death certificates that mention cancer. This results in an underestimate of the number of cases for the years used to generate the estimates. Once the Newfoundland Registry begins receiving information in order to register these cases the difference will disappear. Deaths may correspond to cases diagnosed in previous years, so year to year variation is also a factor for rare cancer sites.

Incidence Estimates (New Cases) for 2003

The number of new cases was estimated for each age group, cancer site and gender by fitting Poisson regression models to the provincial and territorial yearly values. The assumption underlying Poisson regression is that the annual incidence counts are independent Poisson random variables with a mean equal to the product of the population size for a particular year and the (true) annual incidence rate.

A modification to the projection methodology was implemented for the 2003 edition. In editions before 2003, for each province/territory, age group, gender and site, a separate model for crude incidence rates was used, with year as the only independent variable. The latest projection methodology includes age as a factor with 18 levels, and the inclusion of trend terms was evaluated by the stepwise selection algorithm available in S-plus 2000. The estimates for 2003 were obtained by multiplying the extrapolated crude incidence rates with the demographic projections for the same year. Since longer data series for some provinces were available, estimates for Canada were computed as the sum of the estimates for the provinces and territories.

Occasionally, when the original data show large fluctuations, it has been impossible to obtain results of satisfactory precision from the model. For these exceptions, new cases for 2003 were estimated (after consultation with the provinces/territories) by a five-year average of the most recent available data: Newfoundland and Labrador (male – stomach, pancreas, melanoma, non-Hodgkin's lymphoma, lung; female – melanoma, ovary, non-Hodgkin's lymphoma, lung); Prince Edward Island (male – prostate, kidney; female – all cancers, colorectal, breast, cervix, lung); Nova Scotia (female – lung); New Brunswick (male – oral, melanoma, non-Hodgkin's lymphoma, kidney; female – pancreas, melanoma, breast, non-Hodgkin's lymphoma, lung); Quebec (male – prostate; female – lung); Ontario (male – prostate; female – brain, thyroid); Manitoba (male – oral, melanoma, prostate, non-Hodgkin's lymphoma); and Saskatchewan (males – melanoma, prostate; female – lung).

Prostate cancer incidence projection methodology was modified this year, as the anticipated decline in age-standardized rates from a peak in 1993 was observed until 1995, at which point a new and increasing trend was established. This observation in the summary rates does not apply to the age-specific rates. Since 1981, the age-specific rates for Canada among men under 40 have revealed little change and shown no trend; among men aged 40-59 a steeply increasing trend started around 1991 and has yet to change course; among men aged 60-74 the rates follow the trends in the age-standardized rates from 1991 on; and among men over 75 years of age the brief spike in rates in the early to mid-1990s was followed by a steep decline to levels at or below the 1981 levels. Consequently, age-specific rate projections based on a Poisson regression model fit to

data between 1981 and 1989 were abandoned in favour of Poisson regression models fit to data from 1991 to the most recent year of incidence data available (1998 for Ontario and Quebec, otherwise 1999). The provinces for which this method was applied include Nova Scotia, New Brunswick, Alberta and British Columbia.

Bladder cancer incidence counts were in error for the 1999 reporting year. For all provinces and territories except Quebec and Ontario, 2003 estimates were derived from the five-year average rates based on data from 1994 to 1998. The error was detected during systematic review of the "CCR Summary Review Tables" sent to all provincial and territorial cancer registries and will be corrected for next year. Bladder NOS tumours (C67.9, 8130/3) were incorrectly coded to ICD-9 code 233.7 (in situ bladder) instead of ICD-9 code 188.9 (malignant neoplasm of bladder, part unspecified) for 1999 records only. Also, two 1999 tumour records (C679 and 8130/1) were re-coded to ICD-9 code 2367 and not ICD-9 code 2337. Note: The ICD9/ICD02 concordance error was the result of a CCR systems maintenance operation undertaken last year to update SEER conversion code changes.

The estimates of incidence counts for "all cancers" were computed as the sum of the estimated prostate cancer cases plus the estimate of "all cancers less prostate" using the standard linear model (based on data from 1986 onwards).

Mortality Estimates (Deaths) for 2003

The number of deaths was estimated for each age group, site and gender using a method similar to that used for incidence. For each province and territory, a linear model was used for death rates, with an 18-level age group factor and trend terms selected by a stepwise algorithm. Mortality counts by cancer site for Canada were obtained from the estimates of the provincial and territorial counts.

In the versions of this booklet published before 2003, mortality for colorectal cancer was based on ICD-9 codes 153-154 to be consistent with other publications. However, this underestimates colorectal cancer mortality by about 10%, because most deaths registered as ICD-9 code 159.0 (intestine not otherwise specified) are cases of colorectal cancer. Commencing with the 2003 edition, these cases were included in the definition of colorectal cancer. As a consequence, mortality figures for colorectal cancer have increased quite dramatically from those published before this change.

When the original data show large fluctuations, it has been impossible to obtain results of satisfactory precision from the model. For these exceptions, deaths for 2003 were estimated (after consultation with the provinces/territories) by a five-year average of the most recent available data: Prince Edward Island (male – all cancers, prostate; female – non-Hodgkin's lymphoma, lung); New Brunswick (male – stomach; female – pancreas, non-Hodgkin's lymphoma, lung, leukemia); Manitoba (male – pancreas, kidney; female – all cancers, lung); Saskatchewan (male – prostate, kidney; female – lung); Alberta (males – stomach, thyroid; female – stomach, thyroid).

Estimated Age-Standardized Incidence Rates (ASIRs) and Mortality Rates (ASMRs) for 2003

Starting with the 2003 edition, projected age-standardized rates were computed directly from the age-specific projections. This change in methodology eliminated the need to employ a separate projection methodology for age-specific and age-standardized rates. Additionally the new procedure guarantees the definition that age-standardized rates

are a weighted average of the age-specific rates. In editions of this publication before 2003, incidence and mortality rates were generally estimated using weighted least squares regression, with **some exceptions.** Weights were taken as the inverse of the estimated variances of the actual age-standardized rates. Variances were calculated under the assumption that the age-specific counts used in the computation of the age-standardized rates follow independent Poisson distributions. Regressions were performed for Canada and each province or territory for each site and gender using a linear model, with year as the only independent variable.

Again, when the original data show large fluctuations, it has been impossible to obtain from the model results of satisfactory precision. For this reason and to maintain consistency between the age-specific and age-standardized estimates, annual age-standardized incidence rates for 2003 were estimated by actual age-standardized incidence rates calculated over a five-year period for each of those cases cited in the Incidence Estimates section. Similarly, annual age-standardized mortality rates for 2003 were estimated by actual age-standardized mortality rates calculated over a five-year period for each of the areas and site combinations listed in the Mortality Estimates section.

Prostate cancer incidence projection methodology was modified this year, as the anticipated decline in age-standardized rates from a peak in 1993 was observed until 1995 at which point a new and increasing trend was established. However, this new trend has not aligned with the level that was projected based on a linear model fit to the 1981-1989 data. Several options were explored, and we believe the most accurate projections were obtained by simply computing the age-standardized rate from the projected age-specific counts (discussed earlier). As for the projection of incidence counts, the provinces for which this method of estimating rates was applied include Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, Saskatchewan, Alberta and British Columbia.

Accuracy and Precision of Estimates

The accuracy of an estimate relates to the question of bias: whether or not an estimate is targeting the value of interest. The precision of an estimate refers to the fact that any estimate has a certain variability to it; one cannot "know" an estimate exactly, and therefore the estimate serves only to provide insight into the real, unknown value of interest.

The standard error and coefficient of variation, as well as the confidence interval, are calculated to evaluate the precision of each estimate. The standard error is an estimate of the extent to which an estimate will vary, while the coefficient of variation relates this variation to the actual size of the quantity being estimated. Confidence intervals use the standard error to create a range of plausible values for the quantity being estimated. T' se values are available upon request from the Centre for Chronic Disease Prevention nd Control, Health Canada. Together, these quality measures assess the precision (or mprecision) of a particular estimate but not the accuracy of the estimate. Note that any estimates are subject to error, and the degree of precision depends primarily on the number of observed cases and the population size for each site-gender-province combination, whereas the accuracy is related to the adequacy of the model used in the estimation process.

Because of changes and improvements in the cancer incidence data provided by the provinces/territories as well as changes in the population estimates and the methodology for producing the estimates of cancer incidence and deaths, estimates in the 2003 report may not be directly comparable with those published in previous years. More detailed information on these methods can be found in technical papers available from Statistics Canada.[21,22]

Estimates of incidence and mortality have been rounded as follows: counts between 0 and 99 to the nearest 5, counts between 100 and 999 to the nearest 10, counts between 1,000 and 1,999 to the nearest 50 and counts greater or equal to 2,000 to the nearest 100. Percentages, age-standardized and age-specific rates were rounded to the nearest tenth except in Tables 4 and 6 and Appendix Tables A4 and A6, where space restrictions forced rounding to the nearest whole number. Age- and gender-specific counts/rates are combined before rounding, so it is possible that the totals in the tables do not appear to add up. However, any of these discrepancies must be within the precision of the rounding units described above.

Average Annual Percent Change (AAPC) in Cancer Incidence and Mortality

The AAPC values were calculated for each site by fitting a model that assumed a constant rate of change in the ASIRs or ASMRs, that is, a linear model applied to the ASIRs and ASMRs after logarithmic transformation. The estimated slope resulting from that fit was then transformed back to represent a percentage increase or decrease. Data from 1991 to 1998 were used for incidence and from 1991 to 1999 for mortality. These series were long enough to create estimates of AAPCs that were both reliable and current.

Estimates of Non-Melanoma Skin Cancer for 2003 in Canada

The pathology laboratories in British Columbia send all diagnostic reports of non-melanoma skin cancer to the provincial registry. It is assumed that non-melanoma skin cancer is under-reported to some extent. The age- and gender-specific incidence rates in British Columbia for 1985-1994 (in 20-year age groups) have been projected to the current year and applied to the Canadian population estimates to generate a minimal estimate of the number of cases for Canada as a whole. A special study on non-melanoma skin cancer in British Columbia covered this period.

Probability of Developing/Dying from Cancer

Probabilities of developing cancer were calculated according to the age- and gender-specific cancer incidence and mortality rates for Canada in 1998, and life tables based on 1996-1998 all-cause mortality rates. The methodology used was that of Zdeb[23] and Seidman et al.[24] The life table procedures used assumed that the rate of cancer incidence for various age groups in a given chronological period will prevail throughout the future lifetime of a person as he/she advances in age. Since these may not be the rates that will prevail at the time a given age is attained, the probabilities should be regarded only as approximations of the actual ones.

The probability of dying from cancer represents the proportion of people dying from cancer in a cohort subjected to the mortality conditions prevailing in the population at large in 1998. The indicator was calculated by determining the proportion of deaths attributed to specific types of cancer for each gender and age group, multiplying this

proportion by the corresponding number of deaths in the life table and summing the life table deaths over all gender and age groups to obtain the probability of dying from each cause.

The Total Number of New Cases or Deaths, Showing the Contribution of Change in Cancer Risk, Population Growth and Change in Population Age Structure

Figures 2.3 and 2.4 display the determinants of increases in incidence and mortality for males and females respectively. All three series plotted on each graph refer to data from 1971 as the baseline. The uppermost series is a plot of the annual Canadian cancer cases/deaths observed or projected. The next to uppermost series is an estimate of the cancer events expected if the age distribution of the 1971 population were held constant through time. The next to baseline series is an estimate of the expected number of cases/deaths assuming a population constant in both magnitude and distribution from 1971 to the current year.

In preparation of a more rigorous presentation of how these series were computed, let $P_{i,t}$ represent the gender-specific total population in Canada for year t, where i = M for males or i = F for females. That is, $P_{i,1971}$ represents the total 1971 Canadian female population. Next let $ASR_{i,t}$ denote the all-cancers, gender-specific, age-standardized incidence/mortality rate with the reference population being the 1971 Canadian population of the gender corresponding to i, which is either i = M for males or i = F for females. For example, $ASR_{F,2001}$ is the age-standardized rate for Canadian females in the year 2001.

Uppermost series: The annual number of Canadian cancer cases/deaths of gender i for a given year, say t.

Next to uppermost: Total population for year t times the age-standardized rate for year t or, in symbols, $P_{i,t}ASR_{i,t}$.

Next to baseline: Total 1971 population times the age-standardized rate for year t or, in symbols, $P_{i,1971}ASR_{i,t}$.

Baseline: The observed number of Canadian cancer cases/deaths for gender i that occurred in 1971.

Potential Years of Life Lost (PYLL)

The indicator was calculated by obtaining deaths for ages < 1, 1-4, 5-9, . . . 90+ for Canada in 1999 and life expectancy at the midpoints of the age groups. The PYLL is the total number of years of life lost obtained by multiplying, for each age group, the number of deaths by the life expectancy of survivors.[25]

Population Attributable Risk (PAR)

Population attributable risk (PAR) estimates used in the PYLL calculations were obtained by combining mortality data, smoking prevalence and relative risk estimates by gender, age and disease. Smoking prevalence was estimated using Statistics Canada's General Social Survey,[26] while relative risk estimates were obtained using SAMMEC II.[27] Smoking-attributable mortality (SAM) was calculated[28] for disease components with known elevated relative risks within the specific disease range. SAM was estimated

as the product of the smoking-attributable fraction (SAF) and the number of deaths in each gender, age group, and disease component. SAF was calculated as follows:

$$SAF = ([P_0 + P_1 (RR_1) + P_2 (RR_2)] - 1) / [P_0 + P_1 (RR_1) + P_2 (RR_2)],$$

where P_0, P_1 and P_2 denote never, current and former smoking prevalence respectively, and RR_1 and RR_2 denote relative risk estimates for current and former smokers respectively. PAR was then calculated as the total SAM divided by the total number of deaths for each gender, age and disease grouping.

Prevalence

The prevalence of cancer cases in the Canadian population was estimated by cancer site based on diagnoses within 15 years of the target year. Cancer incidence data were obtained from the National Cancer Incidence Reporting System (before 1992) and the Canadian Cancer Registry (1992-1998), and survival data were obtained from the Information Management Division, Saskatchewan Cancer Agency. For each cancer site, data were stratified by month of diagnosis, age at diagnosis and gender. Expected prevalence was then calculated as the product of the age-specific crude survival rate and the number of incident cases. The stratum-specific estimates were aggregated by cancer site.

Survival rates were based on data from the Saskatchewan Cancer Registry. Data were first stratified by cancer site, gender and age groups 0-34, 35-64 and 65 or older, then monthly survival was calculated using the life table method as implemented in SAS version 6.12 (right censoring was adjusted for in the standard way). These estimates were based on cases diagnosed from the beginning of 1983 to the end of 1997, with follow-up to the end of 1998.

Annual national cancer incidence counts were stratified by year of diagnosis, cancer site, gender and age groups 0-1, 2-4, 5-9, 10-14 and so on by five-year age groups to age 85 and older. These data were then uniformly distributed to each month throughout the year by dividing the number of cases in each stratum by 12. Prevalence for 1998, allowing a maximum of 15 years of survival, was estimated within each stratum as the product of the crude survival rate and the corresponding case count. Estimates were limited to a maximum of 15 years' survival, which corresponds closely with lifetime prevalence, and used survival estimates up to the limit of their reliability.

NHL – Classification

Two histology classifications based on the *International Classification of Diseases for Oncology* (ICDO) editions 1 and 2 were used for the non-Hodgkin's lymphoma (NHL) special topic. For time trends, cases were subdivided into three broad histologic groups: follicular (ICDO: 969), diffuse (ICDO edition 1: 959-964, 974 and 975; ICDO edition 2 959, 967-968, 974), and not otherwise specified types (ICDO: 800-958, 965-966, 970-973, 976-999). For the most recent period the classification based on edition 2 was AIDS-associated (immunoblastic lymphoma) (9684), Burkitt lymphoma including small cell noncleaved (9686, 9687), intermediate-grade large-cell diffuse lymphomas (9680-9683, 9593), small lymphocytic (9670, 9671), follicular and nodular (9690-9698), other diffuse NHL (9590-9592, 9594-9599, 9672-9679, 9685), specified cutaneous and peripheral T-cell lymphomas (9700-9709), other specified NHL including MALT (9710-9719), and other and unknown (8000-9589, 9600-9669, 9688-9689, 9720-9999).

In past years, other Special Topics included

- cancer incidence in young adults (2002);
- survival rates (2002, 1995, 1991-1993);
- colorectal cancer (2001, 1995);
- progress in cancer control (2000);
- relative impact of population growth and aging on cancer incidence in Canada (1999);
- cancer surveillance in Canada (1999);
- international comparisons (1998);
- 10 year review of Canadian cancer statistics (1997);
- evaluation of the accuracy of estimates (1996);
- prostate cancer (1996);
- economic burden of cancer (1996, 1990);
- prevalence estimates (1995);
- breast cancer (1993);
- smoking prevalence and lung cancer (1991);
- cancer in Aboriginal populations (1991);
- age-specific trends among women (1990);
- cancer rates by income level (1990).

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Canadian Cancer Society National Office
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However, we will be pleased to receive your completed form at any time.

1. For how many years have you used the Canadian Cancer Statistics publication?

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   - ❑ Hard copy
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3. In which of your professional activities does this publication assist you?
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	Not useful	Somewhat useful	Very useful
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Probability of developing dying from cancer	❑	❑	❑
Potential years of life lost due to cancer	❑	❑	❑
Prevalence	❑	❑	❑
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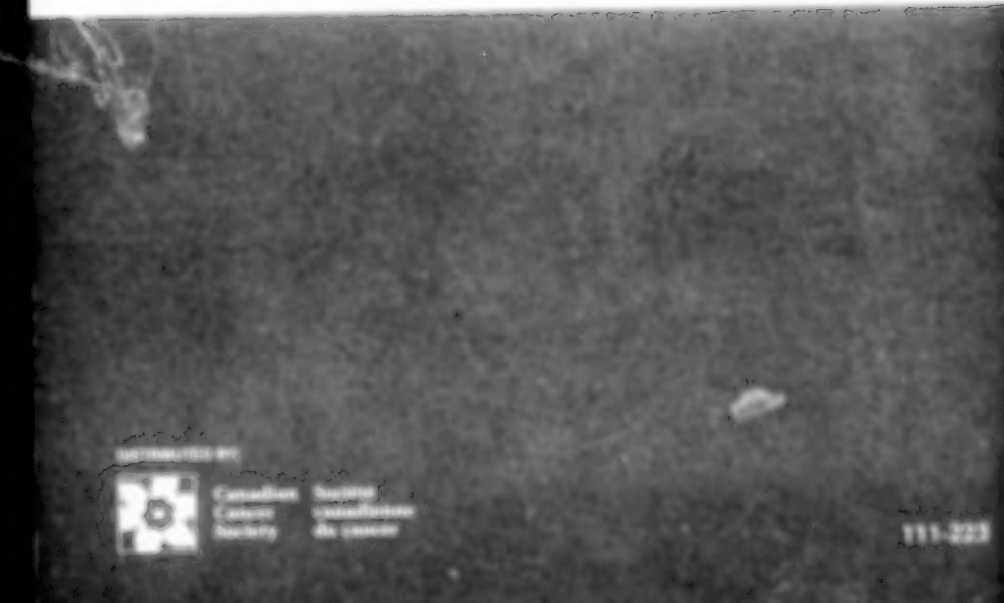

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